

# DESTINATION SPACE!

Join The Crew



## Destination Space

Final Project Report

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By Dr Penny Fidler and James Summers

UK Association for  
**Science and  
Discovery Centres**



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# Map of the 20 Science Centres delivering Destination Space



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## Executive Summary

Destination Space is a national STEM programme to engage, inspire and involve families with school-age children, school groups and communities across the UK with the amazing stories, science and achievements of human spaceflight, as part of a national celebration of Tim Peake's Principia mission.

ASDC and partners created, developed and delivered an excellent set of science engagement equipment along with a suite of activities including an interactive hands-on family show, three curriculum-linked STEM workshops for schools, a series of 'meet the expert' activities and special event and branding materials. ASDC then selected, equipped and trained 20 UK science centres to deliver the full Destination Space programme to inspire people across the nation with Tim Peake's mission.

The families programme of Destination Space launched in the October half term 2015, followed by the schools programme in January 2016. Delivery continued in the science centres until January 20<sup>th</sup> 2017 with many centres saying they will continue to engage their audiences with both the public and schools programme into the future.

Overall **733,017** children and adults have participated in Destination Space, taking part in the school workshops, family shows or at events to celebrate Tim Peake's launch into space and safe return. Of these, **100,244** were school students who had been brought by teachers to science centres to take part in specific curriculum-linked schools' workshops. Overall, 75,741 people met and spoke with a space scientist or engineer through the special meet the expert events, helping to showcase the types of careers that are possible with science.

In addition, Destination Space special events engaged audiences at a wide variety of events across the UK including Farnborough Airshow, Bluedot Festival and the Principia Schools conferences in York and Portsmouth.

ASDC and partners also created a vibrant, public-facing website ([www.destinationspace.uk](http://www.destinationspace.uk)) to showcase Destination Space events across the country, give open access to all the programme resources and enable people to continue exploring the science and adventure of Tim Peake's Mission online and through social media.

Independent academic evaluation of the Destination Space programme was conducted by Professor Justin Dillion and Dr Ana Moncada of the University of Bristol. Overall 12,120 students were evaluated following their participation in a workshop to explore if there had been any changes in, for example, their interest in science or their desire to study science. The evaluation also collected postcode data of the school for every child evaluated.

Overall students from 1,671 different schools participated in the Destination Space Programme at the 20 centres. Analysis of the school postcode on the indices of multiple deprivation revealed that overall more children came from schools from the fifth most deprived quintile (23.1%) than from the first most affluent quintile (17.6%). This is delightful as it means across this ASDC programme and throughout the UK, the science centres are as standard reaching a higher proportion of the students from areas and schools high on the indices of multiple deprivation, than are in the population.

For each of the 12,120 students evaluated, their results were also analysed against their school postcode to see if those children from more deprived regions showed any difference in their enjoyment or interest of the workshops or in their subsequent interest in studying

science. We are delighted to report that there was no significant difference on any of the areas analysed: Children from schools in the most deprived areas on the indices of multiple deprivation are just as likely to be enthused and inspired by these hands-on science and space workshops as children from more affluent areas.

Another excellent result of the academic evaluation related to gender. Much of the content was physics and engineering based, and across almost every question and across all ages, girls and boys showed the same level of enjoyment of the workshops and activities, interest in science, and desire to study science as a result of the workshop. This is a remarkable finding for a national physics and engineering STEM programme. However, it is not unexpected, as ASDC had designed the whole programme to be gender neutral, had ensured science centres were mindful of the gender balance and have created and delivered other national physics and engineering programmes that also successfully and equally appealed to both genders.

**573 Teachers were also evaluated, with the results as follows:**

- 97% would recommend the workshop to other teachers
- 98% rated workshop as very good or good
- 98% rated the equipment as very good or good
- 84% will use activities and ideas in class
- 99% rated the knowledge of the staff running the workshop as very good or good

**Of the 12,120 school students evaluated:**

- 90% of 5-7 year old students enjoyed the workshop (n=3,272)
- 55.6% of students aged 5-7 said that they would find a job in space interesting when they grew up.
- 92% of 7-11 year old students said they had enjoyed the science workshop.
- More than half of 7-11 students said that the workshops made them more interested in having a job in science.
- 93% of 11-14 year old students thought that the activities would help them with school science.
- 59% of these students said that they had never used this type of equipment in school before, and only 6.5% of students reported that they used similar equipment often.
- 47.5% of 11-14 year old students felt that the activities made them feel more interested in studying science in the future. 49% of students said that they were just as interested after the workshop as they were before.

**Of the 1692 children visiting with their families, who completed an evaluation:**

- 92% said that they were more interested in studying science in the future.
- 79% declared that they were more interested in science than before the show.
- 95% reported that they liked space more than they did before the show.

## An Overview of Destination Space

**The Vision:** To engage, inspire and involve families with school-age children, school groups and communities across the UK with the amazing stories, science, achievements and innovative ideas of human spaceflight as part of a National Celebration of Tim Peake's mission.

**The Mission:** To deliver an inspirational and hugely exciting national hands-on programme of space activities and experiments for children, schools and families across the UK, through the successful infrastructure of the UK's science and discovery centres and science museums.

### The Programme Goals

The 6 key goals for this national programme, in order of importance, were as follows:

1. To inspire and intrigue children and their families nationally with a new sense of curiosity, questioning and adventure in relation to space, our planet and human space flight.
2. To inspire children and their families to explore, test, experiment and discuss the amazing range of science and engineering needed for successful human space flight.
3. To inspire both schoolgirls and schoolboys to consider careers in the space sector and in science and engineering more widely. All the evidence points to young girls especially feeling 'it's not for me' and we would like to counter this.
4. To build family science capital, given we know 67% of young people feel they get most careers advice from family, and that family science capital is the biggest predictor of whether students will study science (and 80% of a schoolchild's waking time is spent out of school).
5. To increase the public engagement opportunities of UK space scientists and engineers (especially women) and enable the public to meet them in informal settings.
6. To train science engagement professionals embedded in ASDC member organisations across the UK to engage the public with the latest in space science, planetary observation, Tim Peake's mission and all human space flight so they can continue to engage their 20 million visitors into the future, providing a national educational legacy for this programme.

### The Key Audiences

The key audiences for this national programme were:

1. Young people aged 5-14 to explore learning about the space, astronauts, Tim Peake's mission, engineering and the physical sciences in informal contexts. There was a special focus on children aged 7 - 10, an age group that the SPIRES academic report has showed is vital to engage for longer term interest and engagement.
2. Parents and families of these young people so they were equally inspired and continued to inspire and encourage their children's science learning and career



aspirations long into the future, seeking out other related activities to involve their children with.

3. Teachers, to inspire them to engage their school groups (aged 5-14) with the mission and science, and to bring their classes to science centres to discover more in astronaut programmes and science programmes.
4. Community groups, families from disadvantaged areas, brownies, guides, cubs and scouts, to encourage them to get involved with Tim Peake's mission and science more generally.
5. Science centre and museum staff who would ensure these shows and space science relationships were catalysts for future science learning programmes focussing on UK space science and engineering, and inspiring girls with careers in this area.

## Project delivery targets

This programme began as a smaller project focusing only on public audiences. The initial stage of the programme has been referred to as 'Level 1'. In April 2015 it was confirmed that additional funding for the national programme had been confirmed resulting in the goals of the programme expanding to engage school audiences and to include an additional 5 science centre delivery partners. This programme expansion was referred to as 'Level 2'. This report details the national programme as a whole, with Levels 1 and 2 combined.

### Level 1

In the Level 1 agreement, ASDC proposed reaching 150,000 people across the UK by delivering family shows and meet the expert events in 15 science centres. These numbers would be reached by March 31<sup>st</sup> 2016. Level 1 was smaller in scope and budget and focused on engaging families only and did not include school audiences. ASDC has completed and exceeded the Destination Space Level 1 deliverables.

### Level 2

Level 2 substantially enhanced the scope and funding for the Destination Space programme, to include both public family audiences and school audiences aged 5-14 years.

Level 2 combined the initial Level 1 funding and deliverables with the Level 2 funding, creating a combined Level 1 and 2 programme that would reach 250,000 people across the UK, of which 30,000 would be school children aged 5 - 14. Level 2 also added 5 new delivery centres to the programme, bringing the number of Destination Space delivery partners up to 20. The combined delivery target was 250,000 people by February 2017. ASDC and our science centre partners are delighted to report that the overall programme has exceeded the Destination Space Level 1 and 2 delivery targets.

## The Project Partners

### The Development partners

This programme was directed and project managed by The UK Association for Science and Discovery Centres who have considerable experience managing national strategic multi-partner science engagement programmes. The programme was delivered in collaboration with three expert content partners:

- The National Space Centre, Leicester
- The Science Museum, London
- Jodrell Bank Discovery Centre, Cheshire

### The 20 Selected Delivery Partners:

1. Aberdeen Science Centre
2. At-Bristol
3. Cambridge Science Centre
4. Centre for Life
5. Dundee Science Centre
6. Dynamic Earth
7. Eden
8. Eureka
9. Glasgow
10. Jodrell Bank
11. National Space Centre
12. Royal Observatory Greenwich
13. Science Museum
14. Techniquet
15. Techniquet Glyndwr
16. The Observatory Science Centre
17. Thinktank
18. W5
19. Winchester Science Centre
20. World Museum

### What Each Science Centre was given:

ASDC understands that all ASDC members are different. They have different strengths and existing partnerships, different audiences and unique relationships. We know that every centre wants to play to their strengths and run slightly different activities and events and needs freedom over how they choose to run these with their visitors if they are to do their very best work. We always fully endorse this approach and indeed ASDC designed all elements of this project to maximise this flexibility. Our goal was that 20 selected centres had the freedom to evolve and adapt the Destination Space workshops if they wished, to take advantage of their expertise and existing relationships with universities and to enhance the way their audiences engage with the physical sciences.

**The 20 selected science centres were given the following:**

1. An exceptional set of adaptable hands-on equipment including a replica Sokol suit.
2. A £10,000 Grant to assist with running the programme.
3. Full and detailed training on how to use all the equipment, the types of hands-on experiments each piece can be used for, and all the related science.
4. Places for two staff at two, two-day residential training academies. Their travel, food and accommodation were paid for by the project.
5. A schools show for 5-7 year olds.
6. A schools workshop for 7-11 year olds.
7. A schools workshop for 11-14 year olds.
8. A family show for 7-11 year olds and their parents.
9. A 'meet the expert' format.
10. A Training Handbook for all staff involved.
11. A full marketing pack, including logos and branding material, sample press releases, professional photos of the workshops for marketing leaflets and curriculum links for teachers.
12. Evaluation forms and instructions for the project evaluation.
13. A website [www.destinationspace.uk](http://www.destinationspace.uk) for their visitors and staff to continue engagement activities at home.
14. One staff places for every centre at the National Meeting in 2017 at the European Astronaut Centre to share knowledge and expertise with the delivery partners.
15. Advice and on-the-phone support from ASDC and the project team throughout on any issue to maximise delivery, and to support staff working with new techniques and equipment.

The full set of project materials was licensed under creative commons and is available to all in the resources section of the Destination Space website ([www.destinationspace.uk](http://www.destinationspace.uk)).

## The Impact of Destination Space: 733,017 people engaged

### Overall number of participants

The 20 delivery partners have been delivering the Destination Space programme for family and public audiences since the October Half term 2015. This was just before Tim Peake's launch into space. The schools programme then launched two months later in January 2016. Both Programmes ran through until early 2017.

As of the 20<sup>th</sup> January 2017, **733,017** people had participated in a specific Destination Space programme, for example a family show or a curriculum-linked schools workshop. The table below shows the number of people participating in school workshops, shows, meet the expert events and a range of other special events.

This National Programme has far exceeded its original target, reaching 483,017 more than proposed Level 1 and 2 target of 250,000.

### Reach and Impact of each part of the programme

The table below gives details of how many people took part in which activities.

Type of Workshop or activity	Number of participants
1. Family Astronaut Show	263,469
2. Meet the expert series of events (including school audiences)	75,741
3. KS1 show (including teachers)	23,226
4. KS2 workshop (including teachers)	51,612
5. KS3 workshop (including teachers)	7,022
6. Brownies and Guides Events	13,692
7. Special Events –e.g. launch/landing	298,255
<b>Total</b>	<b>733,017</b>

## Schools engagement

Of the 733,017 people that have taken part in Destination Space activities, 100,244 have been school children visiting in a formal school group with their teacher for a curriculum-linked school workshop and meet the expert activity (all with a careers component). The table below details the number of school children who have taken part in Destination Space activities, the number of teachers and the type of activity:

Activity	Number of school children reached	Number of Teachers	Total Students + Teachers
KS1 show	19,903	3,323	23,226
KS2 workshop	46,289	5,323	51,612
KS3 workshop	6,474	548	7,022
Meet the Expert (schools event)	27,578	4,363	31,941
<b>Total</b>	<b>100,244</b>	<b>13,557</b>	<b>113,801</b>

The delivery target for Level 2 of the Destination Space programme was to engage 30,000 school pupils between the ages of 5- 14 by February 2017. Destination Space has enormously exceeded this target and engaged 100,244 school pupils with Tim Peake's mission and the wonders of human space flight. This has exceeded our target by 70,244 school pupils. 13,557 teachers also took part in the workshops, taking ideas and knowledge back to the classroom.



## Quotes from School Children, teachers and parents

*"When I grow up, I want to send astronauts to space!"* (Young Visitor)

*"I liked the robot arm because it was challenging and I like challenges"*  
(Pupil, age 9, female)

*"I am more interested in having a job in science, because there are a lot of interesting things that I now want to know."* (KS2 Student, Bede Community College)

*"They were fascinated by the experiments they did – a lot of the children have really developed an interest in science that they did not have before. A fantastic school trip – thank you!"* (Year 4 teacher)

*"We really liked the Tim Peake introduction video. The staff who led the session were brilliant – they interacted well with the children and the children really responded to them. This whole space topic has really motivated our children to want to learn more in science. This workshop further enhances their interests about space through a very practical approach."* (Year 4 teacher)

*"It has introduced them to the world of work involving science."* (Year 4 teacher)

*"Awesome show and awesome staff! We'll be back for Tim's return party."*  
(Adult visitor)

*"Very good knowledge, pitched at a good level, captured the interest of all and good balance between talking and interaction with the class. They'll be asking more questions and enthusiastic about science."* (Teacher, St Monans PS, Fife; First Level schools workshop.)

*"I did not really like science but I do now"* (9 year old girl after the Destination Space workshop)

*"I think the children were fully engaged and the experience has definitely increased their curiosity for science!"* (Year 5 teacher)

*"I also enjoyed the science show within the theatre, where my son took part as volunteer. I really enjoyed learning more about Tim Peake on the space station as my son has been learning this at school, was great seeing him understand and relate to his learning more."* (Visitrac)

*"Friendly accessible presentation."* (KS3 teacher)

*"My favourite thing was thinking about change of lifestyle in space because I had to think about things."* (KS3 student)

*"My favourite thing was working in a group to experience tasks that Tim would have."* (KS3 student)

*"I like the demonstration of the fuel and oxygen because of the look and it was exciting. I also liked the robot arm because it was challenging."* (KS3 student)

*"Talk was brilliant and will be using some of those facts in my classroom."* (Visitor review)

*"I want to be a scientist because I want to make an important discovery."* (Female student aged 9 from Nottingham Girls High School)

*"I found out how exciting it is."* (Female student aged 9 from Nottingham Girls High School)

*"It was hands-on which kept the students interested and thinking deeply."* (KS3 teacher)

*"A huge effect! All they talked about on the way home wanted to be an astronaut!"* (Yr. 4 teacher)

*"The spacesuit workshop was super because it was hands on – everyone had a turn and the message was clear and simple – we need the correct clothing for the job!"* (Yr2 teacher)

*"They were really interested in the show and I felt this developed their interest in space."* (Yr2 teacher)

*"It showed me that there are lots of jobs to do with science, ones that would have amazing experiences and unforgettable things."* (12 yr. old female pupil)

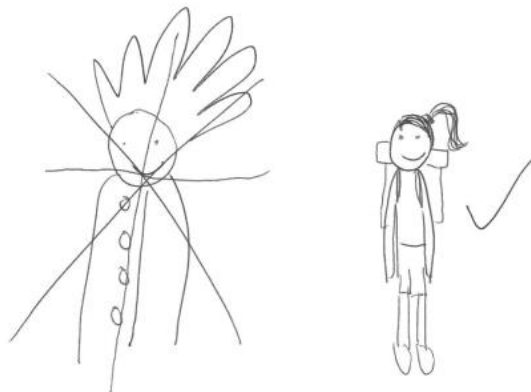
*"I have always wanted to be a scientific engineer and the workshop got me more interested in science."* (9 yr. old male pupil)

*"I would like to teach other children about space."* (9 yr. old pupil)

*"I learnt that science isn't just about writing, it's also about having fun."* (9 yr. old female pupil)

Use this space draw a scientist!

Have your perceptions changed?



## Value for Money

The Destination Space programme received a total funding of £684,868 for level 1 and 2 combined.

Owing to the structure of the programme, the flexibility in delivery, the expertise of the science centres and the exciting and newsworthy prominence of the subject matter, the programme greatly exceeded its targets delivering hands on activities across the UK and engaged 733,017 people through 20 science centres. This gave a cost per head of £0.93 per person engaged in Destination Space.

It should be noted here, that the science centres contributed a huge amount in kind to the programme in terms of staff time, expertise, infrastructure and resources. As educational charities specialising in science, this was a win-win as it leveraged all their infrastructure and expertise into the programme in a manner that delivered to their charitable mission.

Had the programme reached its contracted target of 250,000 people across the UK, the cost per head would have been £2.74.



The programme also engaged large numbers of people via the Destination Space website and more widely the vibrant and considerable social media networks of all the individual science centres and science museums. These are not counted in the 733,017 reached as part of the programme. Given some of our science centres and museums have a hundreds of thousands of twitter and facebook followers, this was always seen as a key form of sharing content widely and regularly.

The programme continues to be run at the majority of centres increasing the reach and providing even better value for money.



## Independent Academic Evaluation of Destination Space

An independent evaluation of The Destination Space programme was undertaken by Professor Justin Dillon FLS FCollT, Professor of science and environmental education at the University of Bristol. Professor Dillon is also the President of the National Association for Environmental Education, and had previously led the academic evaluation for Explore Your Universe, a national science and engineering engagement programme funded by the Science and Technology Facilities Council (STFC). Professor Dillon and his academic team led the independent evaluation of this programme from the start of the project.

Their full evaluation report which evaluates a total of 12,120 school children, 904 family groups and 573 teachers who took part in the programme at 20 science centres is available via the ASDC website ([www.sciencecentres.org.uk](http://www.sciencecentres.org.uk)).

The evaluation instruments for Destination Space were developed by Professor Justin Dillon and consisted of the following:

1. A family show/special event questionnaire
2. A teacher questionnaire
3. 5-7 workshop questionnaire
4. 7-11 workshop questionnaire
5. 11-14 workshop questionnaire.
6. A Metrics forms.

Each Science Centre was asked to provide a minimum of 500 school evaluations, 25 teacher evaluations and 35 family and special event evaluations. These evaluations were administered and collated by the science centres. Science centre staff then input these into online system created by Professor Dillon's team. The data analysis was then undertaken by Professor Justin Dillon and Dr Ana Moncada from the University of Bristol.

### Number of participants in the Destination Space evaluation

Evaluation Activity	Target	Number of completed evaluation forms
Schools Workshop (KS1,KS2,KS3)	12,000	12,120
School Workshop: Teachers	500	573
Family Show	600	701
Families involved in special events	200	203
<b>Total</b>	<b>13,300</b>	<b>13,597</b>

## Key Findings of the Academic Evaluation

- Evaluation instruments were designed for school children in three age groups 5-7, 7-11 and 11-14.
- A total of 12,120 evaluation forms were returned from school children by the science centres. A total of 904 family groups and 573 teacher evaluations were also carried out by centres. The data were analysed by the University of Bristol.

### Impact on children with Families

#### Of the 1692 children in families who completed an evaluation:

- 92% said that they would be more likely to be interested in studying science in the future.
- 95% of the children participating in a family group reported that they liked space 'a lot' or 'a bit' more than they did before the show.
- 79% of children declared that they were more interested in science than before the show.

### Teachers' views on impact

#### Of the 573 teachers who completed an evaluation:

- 98% of teachers rated the activities as very good or good.
- 99% of teachers considered that the knowledge of the centre staff was very good or good. Teachers valued the enthusiasm, the knowledge and the approachability of the staff.
- 97% of teachers considered that the access to the science content was very good or good.
- 98% of the teachers declared that the equipment used in the activity was very good or good.
- 97% of the teachers found that the venue was very good or good.
- 84% declared that they would use ideas, experiments, films and online resources related to the activities in their classroom.
- 97% declared that they would recommend the workshop to other teachers.
- 87% felt that the workshop was good value for money. 11% were unsure (often as they did not know the cost) and less than 2% felt that the workshop was not good value for money.
- 53% reported that they knew about the work of the UK Space Agency or the European Space Agency before engaging with this programme.

## Impact on the School Students

12,120 students were evaluated. The most popular workshop that the centres ran was the 7-11 year old schools workshop. Overall, the programme was attended by more children from schools from the fifth (most deprived) quintile (23.1%) on the Indices of multiple deprivation than the first (least deprived) quintile (17.6%).

### Students aged 5 - 7 (n = 3,345)

- 90% of 5-7 students evaluated (n=3,272) enjoyed the workshop with girls enjoying the show slightly more than boys (91.8% females and 87.6% males).
- 55.6% of students aged 5-7 said that they would find a job in space interesting when they grew up, and 28% were not sure. Boys were significantly more likely to be interested in a job in space than girls (59.7% of boys and 51% of girls).
- After the show, more than half the students aged 5-7 thought that a job in space would be interesting. Males were significantly more likely to be interested in a job in space than were the girls.

### Students aged 7 - 11 (n = 7,504)

- 92% of 7-11 students evaluated stated they had enjoyed the workshop.
- The girls enjoyed the workshop slightly more than boys (92.9% females and 91% males)
- Many of the students (61.9%) said that the workshop would help with their school work. Only 4% did not think that it would help. Females were significantly more positive about the impact of the workshop on their school work (64.9% of females vs 59% of males said it would help them with their schoolwork)
- Three-quarters of the students thought that the workshop made them feel more positive about science. Only 2% of students thought that they were less interested in science after taking part in the workshop.
- More than half the students (54.6%) said that the workshops made them more interested in having a job in science. Boys and girls were equally positive about the impact of the workshop.

### Students aged 11 - 14 (n = 1,271)

- 93% of students thought that the activities would help them with school science.
- 84.5% of 11-14 students evaluated stated they had enjoyed the workshop.

- Students were very positive about the workshop with 75.2% saying that they would recommend it to someone else their age. Only 4.4% of students would not recommend the workshop to other children their age (some noting it was better for younger or older students).
- The girls enjoyed the workshop slightly more than boys (85.5% females and 83.7% males).
- 59% of students said that they had never used this type of equipment in school before, and only 6.5% of students reported that they used similar equipment often.
- After the workshop, 47.5% of students felt that the activities made them feel more positive about studying science in the future. 49% of students said that they were just as interested after the workshop as they were before.
- After the workshop, 41.7% of the students said the workshop had made them more positive about a job in science. 51.3% said they were as interested as before. This question cannot tell between those children who are already interested in science and a career in science and therefore this space workshop has confirmed what they think, vs those who are not interested in a science career. What we can tell is the 41% after the one hour workshop say it has made a change in them. 7% of students felt less likely to pursue a space or science career after the workshop.



## Gender Findings across the programme

A total of 12,120 evaluation forms were returned from school children by the science centres. This is out of an overall number of school children participating of 100,244. Every student was asked their age and gender.

- Overall, 51.8% of the 12,120 school students taking part in the evaluation of the school workshops were male and 48.2% were female
- The gender reach of the families programme is 53% female and 47% male.
- Across the data on a host of measures and on almost all occasions there were no differences between the responses of girls and boys.

### Professor Justin Dillon reported the following:

*“While science education in schools is often seen as gendered, with boys preferring physics topics and girls preferring biological topics, there were very few differences between the responses to the Destination Space activities.*

*In some cases there were small statistically significant gender differences although the educational significance was not so clear. In some cases the gender differences varied with the age of the students. For example, in terms of enjoyment, there was a difference for students aged 5-7 but it was not present in the two older age groups.*

*In terms of the question about whether students aged 5-7 were interested in space science related jobs, there were no gender differences for the negative responses, but there were gender differences for the positive and neutral answers.*

*The lack of significant gender differences is something that might usefully be explored in the future.”*

## Specific data on male vs female

### Students aged 5 - 7

A total of 3,345 students aged 5-7 participated in the school workshop evaluation from 16 centres. The gender split overall was 47% female, 53% male.

89.6% of 5-7 students evaluated enjoyed the workshop with girls enjoying the show slightly more than boys (91.8% females and 87.6% males).

In general, the gender distribution in each centre was balanced. However, two centres showed an interesting gender difference in their evaluation forms (noting that this is a sample of all those engaged): Centre for Life (65% male; 35% female) and Science Museum, London (57% male; 43% female).

### Students aged 7 - 11

A total of 7,504 students aged 7-11 participated in the workshop evaluation from 20 centres. The gender split was 50% female; 50% male. Most of the surveys that were received were from students aged 9-10 (73%).

91.9% of 7-11 students evaluated (n=7398 responses for this question) enjoyed the workshop with girls enjoying the show slightly more than boys (92.9% females and 91% males).

### Students aged 11-14

A total of 1,271 students aged 11-15 years old participated in the workshop evaluation from 10 centres. The gender split overall was 41% female, 59% male. The gender distribution within each centre was not balanced. The biggest differences within centres was in W5, where 88% surveys were answered by males and 12% by females. Thinktank, Birmingham delivered more female evaluations (67%) than males (33%). In terms of age, most of the surveys that were received came from students aged 12-13 (71%) while 10% came from students aged 14-15 years.

84.5% of 11-14 students evaluated (n=1,250 responses for this question) enjoyed the workshop with girls enjoying the show slightly more than boys (85.5% females and 83.7% males)

### Families

904 families (comprising 3,122 people) took part in the evaluation of the family show and special event evaluation. This was made up of 1,396 adults and 1,726 children, a ratio of 1 adult: 1:1272 children. Of these:

- 62% of the adults (n=1,396) were female and 38% male
- 48% of the children (n=1,726) were girls and 52% boys



## Data Sampling

Each centre was asked to evaluate 600 school students. The school evaluations represent a 16.7% sample of the 72,666 pupils who took part in specific school workshops, and 12% sample of the 100,244 school children participating in either a meet the expert workshop or a school workshop. Some of these were from a single sex school on the day of evaluation. An example of this is W5's 11-14 school workshop evaluations which were filled out by 88% male and 12% female students, however the overall gender mix across all their workshops according to their metrics sheet was approximately 65% male and 35% female (percentages reported by centre).

Although the evaluation was only a sample of the 733, 017 people who took part, if we were to extrapolate this to give an estimate of the numbers of males and females overall who took part, we would get the numbers below (rounded to the nearest %).

## Gender balance: results from metric data

Within the overall metrics data, centres were asked to record whether schools were single or mixed sex schools and were not required to record exact male/female numbers. The centres were also not required to record the exact numbers of men and women and boys and girls in families participating in shows. This is because of the large number of people attending shows and school events and staff time restraints. Therefore the overall numbers of males and females who participated in Destination Space is an estimate based upon the general recordings of typical visitor patterns reported by centres.

Activity	Estimated numbers of Females	Estimated numbers of Males
Schools workshops	48.2% (35,025)	51.8% (37,641)
Teachers	Estimated 50% (4,597)	Estimated 50% (4,597)
Family show and events (ratio of adults: children at 1:1272)	53.8% (302,273)	46.2% (259,451)
Guided group	Estimated 50% (6,846)	Estimated 50% (6,846)
Meet the expert	Estimated 50% (37,870)	Estimated 50% (37,871)
<b>Extrapolated total reach</b>	<b>52.7% (386,611)</b>	<b>47.3% (346,406)</b>

## Feedback from Science Centres

All delivery centres are reporting an overall average of 50:50 male: female in their audience numbers. All centres report that they endeavoured to ensure a balance of male and female STEM presenters and experts when engaging audiences to ensure that a gender balance of role models is maintained.

Examples of feedback from centres include:

- *“The majority of At-Bristol Science Centre’s visitors (61%) are female and the minority (39%) are male. Of the three Giant Sleepovers run as part of the Destination Space programme, one group (Brownies) was 100% female, with the other two (Beavers) being mixed.”* (At-Bristol).
- *“To date, all school workshops have been delivered to mixed school groups. The visitors to the three public events were also a mix of girls and boys with parents, grandparents or guardians. We would therefore estimate the gender reach to be 50:50.”* (Cambridge Science Centre).
- *“All of the school and public groups that have attended Destination Space workshops have been from mixed groups, so our audience has an estimated gender split of 50:50. Our most recent general admission visitor statistics demonstrate the gender profile is split 77% female and 23% male.”* (Dundee Science Centre, from 2014-15 data conducted by Lynn Jones Research).
- *“All schools that have taken part in The Observatory Science Centre’s Destination Space Programme both in-house and through their outreach have been mixed gender schools of roughly a 50:50 split. The overall number of people reached by The Observatory Science Centre’s Destination Space Programme is also estimated to be roughly a 50:50 gender split.”* (Observatory Science Centre).
- *“For the school programme we estimate there is a 50/50 split. For our general visitors we average a 57/43 female/male split from onsite research carried out between April 2014 and March 2015.”* (Royal Observatory Greenwich).
- *“To date the evaluation on the family show demonstrates a split of approximately 53% Males and 47% Females in attendance and for the KS2 workshop, 56% Boys and 44% Girls.”* (Techniquist).
- *“The Science Centre is keen to promote female role-models and empower under-represented demographics in the physical sciences. The primary presenter for the KS1 Destination Space Show is female, and with respect to the general public two of the four Destination Space Family Show presenters are female. No demographic data is currently collected on the public audience and so an approximation of 50:50 female: male must be used. There are plans to capture the Science Centre’s audience better in the future.”* (Winchester Science Centre).

### Overall gender reach in Summary

Therefore, erring on the side of caution we would estimate that the gender reach of the programme across all of the areas of families and schools programmes has been at least 50% female and 50% male, and that the programme has therefore engaged 366,509 girls and women across the UK.



## Impact on children from schools in disadvantaged areas

The Index of Multiple Deprivation (IMD), is the official measure of relative deprivation for small areas of the country. In England, the IMD ranks every small area from 1 (less deprived area) to 32,844 (more deprived). The relationship between the IMD and some of the key findings were explored in the data analysis.

1,671 schools participated in the Destination Space Programme at the 20 centres. Of these, 1,551 schools could be linked to the IMD by their postcode. Information for 120 schools from Northern Ireland and a small number of overseas schools could not be obtained.

Overall, the programme was attended by more children from schools from the fifth (lowest) quintile (23.1%) than the first quintile (17.6%). This is great news as it means across the programme we are reaching a higher proportion of the students from deprived areas than those from more affluent areas.

Delightfully, no significant differences emerged across the data. That is, children from schools in the most deprived areas were just as positive about what they had learned and just as positive about careers and studying science as children from schools in the most affluent areas. This is a significant finding. Not unexpected from ASDC's perspective, but delightful to have such a large and robust academic national evaluation providing evidence that we are achieving our goal of reaching and inspiring widely.

## Qualitative evaluation

The open-ended questions allowed students to explain what they enjoyed and/or learned from in the workshops. A number of themes emerged from their comments:

### How it made me feel

The workshop appeared to allow students to relate to the 'fun' of doing science but also to enjoy the hard work associated to it: 'it is a bit hard, but amazing'. In general, their positive responses matched the high survey responses. Typical comments included

- 'I enjoyed all the experiments. I liked the balloon, it was so funny! I liked the music it was so funny.'
- 'I will also remember the robotic arm because it was very cool! Also it made us think about how technology could work in space, hard but very useful.'
- '...created curiosity that I want to find out more.'

### Increasing independence and feeling included

Some students valued being recognised as active participants during the activities. A student from KS1 said that he liked it the most when 'the presenter [was] asking for volunteers'. In KS2 a student said they liked, 'when everyone has to experiment' and in KS3 a student liked it 'when our friend dressed up as an astronaut'. Similarly, students also valued the space to take

their own decisions such as choosing who to work with. Participation as a theme was also evident in relation to the interactivity and hands-on activities, for example:

- 'Because we didn't have fixed instructions with the circuits, you have to experiment.'
- 'My favourite part was making rockets.'
- 'Much more interactive and we didn't just sit at a desk.'

### Fostering scientific learning

When the students were asked what they had learned or would remember from the experience or whether this activity will help them in school science, responses frequently mentioned science learning. Within these responses a number of themes emerged. For example, motivation: 'it created curiosity that I want to find out more', 'the teacher was fun and there were lots of gripping activities'. There were also a number of explicit references to curriculum topics:

- 'I learnt a bit about circuits'
- 'Newton's Law'
- 'Because it helped me understand more about gravity'
- 'Different angles equal different results' or 'Using angles to measure the distance'
- 'the chemical reactions that happened when checking if CO<sub>2</sub> is around'

Other students identified more abstract aspects of learning, making broader connections across science.

### Linking to school science

Most students from KS2 and KS3 thought that the workshop would help in their school. They mentioned two reasons: a) the fact that they have learned 'a lot' or were 'learning new things', and, b) they related this experience to a topic in the curriculum:

- 'Because when we learn this subject I will know things that others might not know'
- 'Because when we do space, I will remember that when you're exposed to space's atmosphere, you will expand'
- 'Because it will be easier to learn if I have some knowledge already'.

Students who considered the workshop unhelpful in terms of linking to school work indicated that space was a previous topic in the school ('We don't learn very much about space in school because we learnt when we were younger.'), or the workshop was far from their school reality ('The things we learned today is nothing about our science', 'we don't do this sort of stuff at school', 'don't really do things like we do in school').

### 'We have more freedom and equipment than usual'

Most of the students acknowledged that the practicals carried out in the workshop were more interactive and less restrained than in the school. Students were able to use what one described as 'Advanced Tech':

- 'It was more crazy and hands on (in a good way)'
- 'More practical than writing and talking'
- 'It is different because at school we mainly investigate more formal things'
- 'there were lots of small things to do instead of one big experiment'
- 'at school we usually don't see robotics or relate the experiments with real life'

- 'More Expensive Equipment'

Thus, the workshop experience seems to represent a different space for scientific learning, and in so doing allows students to see science in a new light. As one student reported, 'we actually got up and did something fun without a full lesson of learning what to do'.

Nevertheless, a few students considered that the workshop was not much different from their experiences in school. 'Not really because we are usually left alone to explore' or 'they weren't that different'.

### Comments on the workshops: developing further interest in science and science-related jobs

For KS3 students who reported that they were more interested in a science related job, many stated that the workshop was 'inspiring' and 'informative'. In terms of inspiring students, they said, for example,

- 'It has shown me different career paths within science, not just the ones everyone assumes'.
- 'I didn't realise how many different areas you can work in'
- 'Because I would love to go to space like the astronauts in the video did and witness the Earth for myself'
- 'It's immersive and challenging'

Other students placed the emphasis on their change in the perception of science, for example, 'Because some people think science is all writing and talking but more than half is practical' and doing so 'It has shown me different career paths within science, not just the ones everyone assumes'. While others appreciated the fun and engagement, for example the workshop: 'Created curiosity that I want to find out more' or 'It is a bit hard, but amazing'.

### Comments on the workshops: improvements

The main recommendation given by students was asking for more time to experiment. Students also wanted more experiments, in particular, in terms of electronics. Overall, participants in the workshop seemed to be very pleased and willing to participate in more of these types of activities.


## Reach of the Website and Social Media

Throughout the Destination Space programme, social media and the specially created website [www.destinationSpace.uk](http://www.destinationSpace.uk) have enhanced the reach of the programme, allowing families and school children to continue being involved beyond their visit to the science centres.

The destinationSpace.uk website has allowed science centres to easily get the latest content and experiments and to share this widely through their own established social media channels, and membership communications, bringing Tim Peake's mission to many more people and on a regular basis. Social media has even led to personal messages from Tim Peake being received by destination space visitors.

The website has allowed people to find out about up and coming events, to build their own mini spacecrafts and other science activities at home with their families, to take the space test and explore different careers that would suit them in space, to discover where the ISS is and to watch it fly over, and to find out about space scientists and those working in space.

01




**Build your own mini craft**

Learn Newton's second law of motion, the science behind hovercrafts and how it all helps to understand how astronauts get into space.

[View Mission](#)


02



**Learn about the pressure of space**

Learn about the science of vacuums in space and atmospheric pressure with a cool exploding marshmallow experiment.


03



**Spot astronauts in space**

Learn all about the International Space Station and track its location in space so you can spot it from earth.


04



**Build your own rocket for lift-off**

Understand the cool science behind rocket launches and getting astronauts into space safely.

05



**Make a space lava lamp**

Create your own Destination Space lava lamp and learn about how liquids behave in space.

## The Website: [www.DestinationSpace.uk](http://www.DestinationSpace.uk)

The following table details the reach of the Destination Space website.

Month	Unique sessions	Join the crew - take the test	Events calendar - page views	Meet the crew - page views	Page Views
October	3,167	2,904	788	1,186	18,101
November	3,207	870	642	365	11,077
December	3,293	839	563	386	9,798
January	5,252	994	679	724	13,934
February	5,499	5,624	1,269	1,491	23,748
March	2,478	978	438	512	8,078
April	1,756	562	169	508	4,556
May	1,261	366	96	417	3,032
June	2,127	243	116	1,133	4,447
July	1,644	893	107	543	4,633
August	934	83	105	155	1,928
September	956	223	66	306	2,152
October	1,275	165	122	317	2,776
November	1,548	768	126	334	4,644
December	1,078	334	52	226	2,883
January	1,441	555	107	383	3,873
February	1,223	602	93	411	4,609
<b>Total</b>	<b>38,139</b>	<b>17,003</b>	<b>5,538</b>	<b>9,397</b>	<b>124,269</b>

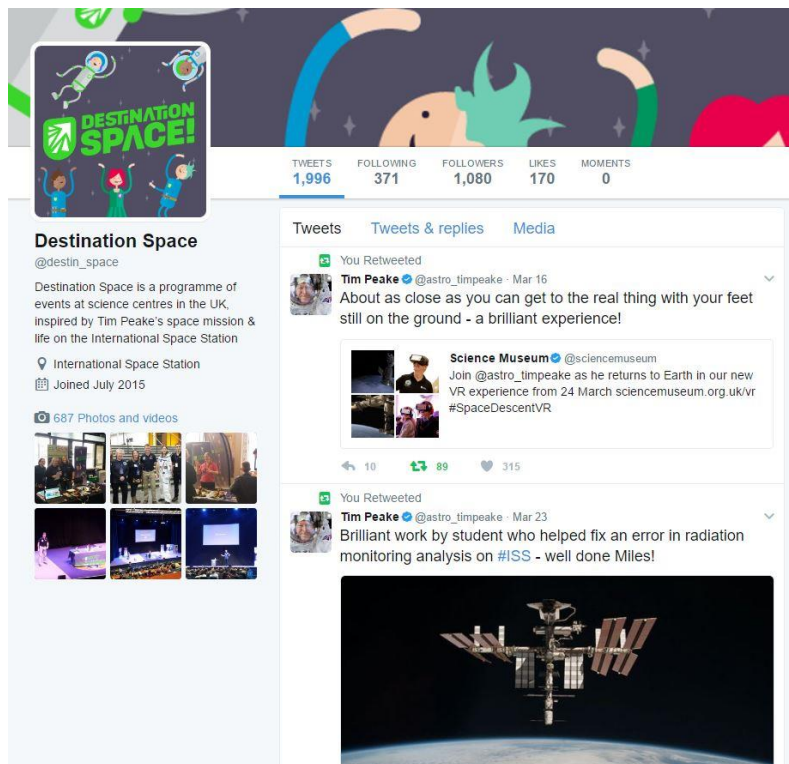
The website launched in October 2015 as a public-facing Principia partner website. It also acted as the central repository for all Destination Space related resources that ASDC produced, and were released under creative commons so all could use them. These resources included the handbook, workshop and show resources, videos and much more. This has been hugely valuable for the science centre delivery partners. However, the key reach has been the 20 centres sharing our content via their social media channels, and we have reached well over a million people in this way.

As of March 1st 2017 the Destination Space Website had attracted 38,139 individual visitors to the site, of which 17,003 have specifically taken the online crew role test. However it should be remembered that much of the content was also given on the science centres website and linked to via their social media. The reach continues to grow and the resources online provide a lasting legacy.

## Social Media

The Destination Space twitter page has 1,080 followers which grew steadily over the course of the programme. This enable ASDC to extend the reach of the programme beyond science centre visits and to run competitions to win special Principia mission items. Through facebook and twitter, personal interactions with families could also take place to enhance the Destination Space experience with one parent sending the following message:

*“Thank you so much for responding to my sons post. He is autistic and has always had a passion for computing, science, astronomy, anatomy and mathematics. He has found a great focus and with Tim Peake’s adventures into space and Destination Space being in contact with him it has made him truly feel that he can achieve whatever he wants when he grows up. I’m sure you will see him pop up on comments from time to time on my facebook page. Every comment back or like makes his day so thank you”.*



The social media reach has been enormously amplified by the 20 delivery partner's own social media networks, which have been the core mechanism of reach of this programme, albeit more difficult to assess. We know that the Science Museum and Eden alone have a combined reach of a million people. The question is how many had read each tweet or facebook post from each of the centres and their staff, across all platforms and across the whole time period of Destination Space.

## How ASDC Created this National Programme

ASDC has created a host of national strategic programmes and has refined a successful development process to ensure the highest quality resources, shows and workshops are created. This process includes phases such as research, content development, centre selection, training and delivery and support which are detailed below.

### Project Research and the Charette

To ensure the very best resources were developed and included within the project, ASDC and the project team undertook a research and development phase finding what currently existed and could be created for the programme.

A key part of this process was the one day Ideas Charrette which was held in At-Bristol. Academics from University of Cardiff and the University of South Wales along with specialists in space science engagement and colleagues from the UK Space Agency took part in this event, discussing the best ways to engage family audience and school students with Tim Peake's mission and human spaceflight. 15 experts took part and the day was chaired and facilitated by ASDC CEO Dr Penny Fidler.

The project team then took all of the information from the charrette and combined this with all their research and knowledge to create a research document. This collated all the excellent engagement activities and resources that already existed across the sector and items we wanted to create or adapt for the public. This formed the basis of the content development for all the Destination space activities.



## Selecting the Partner Science and Discovery Centres

The 20 science centres to be trained and equipped as part of the project were selected through an open invitation process managed by ASDC and selected by a panel. As this programme had two levels of funding, 15 centres were originally selected with 5 additional centres chosen when the Level 2 funding was confirmed.

To achieve this an invitation to participate document along with an application form was sent out to all ASDC member science centres. 20 Applications were received and through panel selection with ASDC and UK Space Agency 15 were chosen for level 1 with the remaining 5 held in reserve should Level 2 funding become available.

Following confirmation of Level 2 funding all 20 centres were informed that they were successful in their applications. Contractual agreements were then drawn up between ASDC and each science centre and signed by all delivery centres, agreeing to meet agreed targets and provide required reports and evaluation data.

Each centre received a £10,000 delivery grant and £4,500 worth of bespoke equipment (including a replica Sokol suit designed specifically for this programme).

## Developing the Schools and Families Activities

The project development team collaboratively developed resources and show formats using the information gained at the charrette and within the research document.

### **The activities developed included:**

#### The Family Show

This suggested show script was for a 30 minute show aimed at families with children aged 7-11. The show told the story of how Tim Peake would launch and travel to the International Space Station, how he would live on board, and how he would get home safely. Videos recorded by Tim Peake specifically for the programme were played at the beginning and the end of the show to make the audience really feel part of the Principia Mission. The show contained modular elements that centres could add to the show to make it longer if required and all supporting resources were provided in the project handbook and on the website.

#### Meet the expert session

Guidance was provided on holding meet the expert sessions for the project and practical tips for working with academics and industry were provided at the training academy. Centres were encouraged to utilise existing links with universities and industries to ensure local collaborative working.

#### 5-7 year old schools show

This 40 minute fun and engaging show was developed for school groups with children aged 5-7. This show encouraged the children to think about the material used in space, what it must feel like for the astronaut, whilst telling the story of how humans get into space, live in space and get home safely.

#### 7- 11 year olds schools workshop

This 45 minute workshop was designed as a carousel style workshop with set stations that groups could work together to conduct scientific investigations. Students start with an introduction from the presenter including a demonstration of how rockets work using a



whoosh bottle. Student then get to take part on 4 stations set up around the room with a range of activities included using robotic arms to pick objects up, investigating materials for absorbency (maximum absorbency garments) and then investigating the dangers of a vacuum in space using marshmallow in syringes or a vacuum chamber with a partially inflated balloon inside. This workshop was designed to encourage investigative skills and experimentation.

### 11- 14 year old schools workshop

This workshop built upon the investigative work of the 7-11 year old workshop so that those needing a higher level workshop could take part. This workshop focused on using robot arms and completing task cards, investigating what materials absorb Carbon dioxide (a nod to the Apollo 13 carbon dioxide filters), investigating circuits using Circuit Scribe conductive ink, and conductive experiments to understand how to ensure the highest energy output from solar panels.

All resources for the shows and workshops are available online at [www.destinationspace.uk](http://www.destinationspace.uk)

## Creating the Set of Equipment

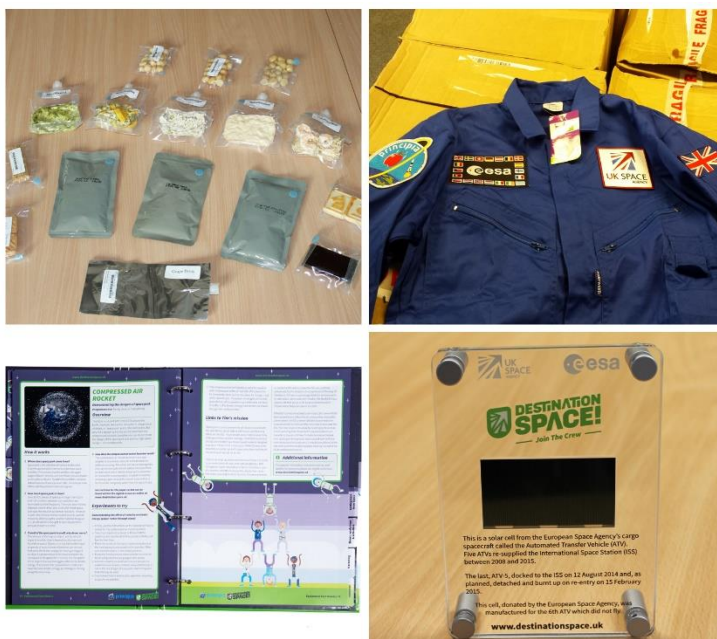
Following completion of the research document and the charrette, an adaptable set of equipment was developed to support all of the elements of the project, allowing science centres to engage their audiences in a variety of ways. The equipment included unique items such as solar cells from a European Space Agency ATV, space food and a replica Sokol suit to help initiate dialogue with audiences.



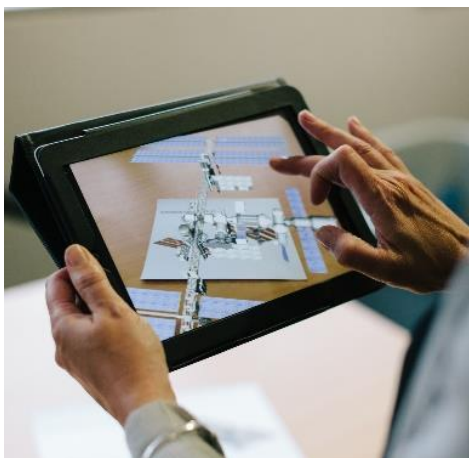


20 sets of equipment were produced which included:

- Replica Sokol Suit
- Mounted ATV solar cell
- Cardboard cutout Tim Peake
- 2 flight suits
- Space food
- Augmented reality International Space Station
- Videos from Tim Peake
- Family show



- Vacuum chamber and pump
- Compressed air rocket launcher
- Hovercraft and portable air blower
- Whoosh bottles or Optional funding for hydrogen/oxygen equipment
- Lifesaver water filtration bottle
- 5-7 schools show
  - Materials for designing a space suit
  - Parachute
  - Childs space suit
  - Magnetic ISS board and Soyuz magnets
- 7-11 schools workshop
  - Robot arms
  - Absorbency experiment kit
    - Syringes
    - Funnels
    - Test tubes
    - Sodium poly-acrylate
- 11-14 schools workshop
  - Robot arms
  - Circuit scribe conductive ink sets
  - Solar panel and voltage meter kits
  - Carbon Dioxide absorbency kit
    - CO2 filter tubes
    - CO2 absorbent materials



# The handbook

The project handbook was created to provide a key understanding of human space flight, Tim Peake’s mission and a guide to all of the equipment, scripts and resources provided in the Destination Space programme.

The 148 page manual is divided into key sections such as Training for space, getting into space and working in space, to allow for centre staff to quickly find information about key topics relating to human space flight. Within each section, relevant equipment sheets detail the equipment that can be used to demonstrate or engage audiences with this particular topic.

All of the suggested scripts for the shows and workshops are provided in this manual which is also available online at [www.destination-space.uk](http://www.destination-space.uk)



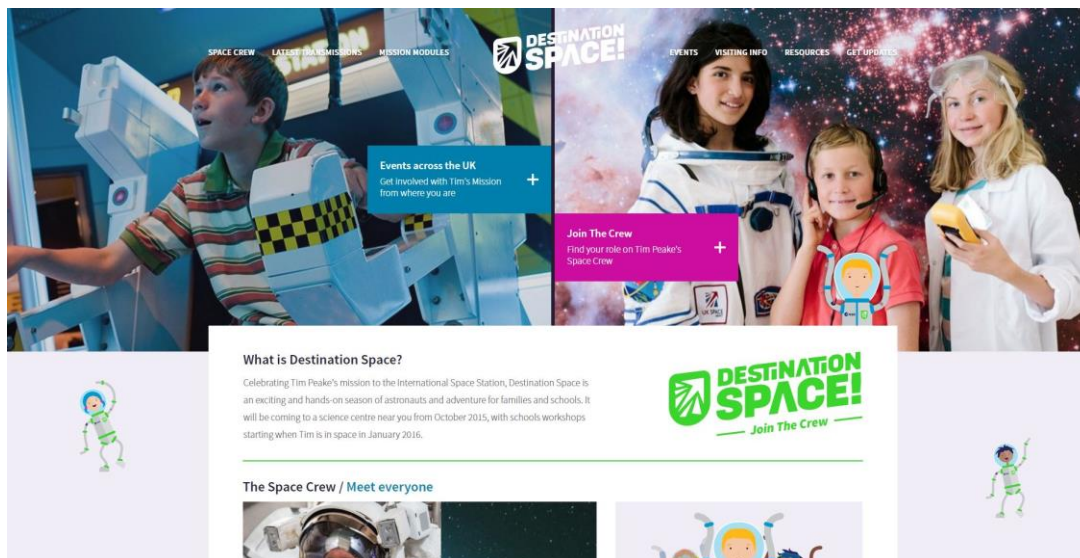
This handbook was reviewed and checked for accuracy by the European Space Agency and the UK Space Agency. Each of the 20 science centre delivery partners have received a copy of this book and all staff at the training academy received training in how to best use the contents.

## The Website

The website was developed through the marketing and branding consultants Happy Seven and ffunction web designers.

The website was designed to support the Destination Space project and to allow audiences to continue their experience of the programme at home as a family. The website included a space role activity to allow people to explore the variety of careers available to anyone wanting to work in the space industry.

There were also a range of 12 try this at home mission activities, that children and their families could take part in at home to enhance their engagement with human space flight.



The website hosted an events calendar to enable families to find their nearest science centre that was delivering Destination Space activities.

A key element for the website is the space crew profiles that detailed 6 profiles of leading space scientists. The purpose of these profiles was to highlight just a few of the many roles that make human space flight possible, encouraging both adults to children to understand that there is a role for everyone.

Destination Space resource including a digital copy of the handbook, images, videos and media toolkits are also available on the website.

## The Training Academies, at the National Space Centre

To ensure that every delivery partner is 100% confident in the delivery of the programme and the use of all equipment and resources provided, ASDC run 2 day training academies for each programme. When required, additional training academies are also provided. During these training days, 2 members from each of the delivery partner science centres attend, and received hands on training in all aspects of the programme, from how to deliver the family show, how to run the workshops, how to use equipment and also training in any health and safety aspects related to the programme. Below are details of the 2 training academies that were run for this programme.

### **Training academy 1: June 17<sup>th</sup> and 18<sup>th</sup> 2015**

40 delegates from 20 Science Centre delivery partners representing senior education and marketing and communications staff, took part at two day training event at the National Space Centre. The focus of this training academy was to prepare and encourage the delivery partners to maximise the reach of the national Space programme. This also provided a great opportunity to get feedback on the proposed programme name 'Future Space Crew'. Following an engaging debate the programme was renamed 'Destination Space'. The input from the delegates and the change to the programme name ensured that all 20 centres could maximise the reach and impact of the programme.

The training academy also provided a first look at the equipment that would be provide for the programme. Talks from Jeremy Curtis, Libby Jackson and Anu Ojah provided a full understanding of the UK and European space programme, Tim Peake's planned mission and available resources and media that could be used to engage audiences. A tour of the national space centre, added to this invaluable information allowing delegates to see a range of space exhibits

Following the training academy all delegates reported feeling more confident on talking about the UK space industry and Tim Peake's mission.



### **Training academy 2: September 8<sup>th</sup> and 9<sup>th</sup> 2015**

40 delegates from 20 Science Centre delivery partners representing education and delivery staff, took part at two day training event at the National Space Centre. The focus of this

training academy was to fully train each of the 20 science centre delivery partners in the Destination Space programme. The training covered how to run the family show, KS1,2 and 3 workshops, meet the expert events and special events such as Tim Peake's launch and landing. The training provided hands on training using all the equipment that was provided for the programme.



The full range of Destination Space resources including the website, social media and branding were provided within the training so that staff could work closely with their colleagues who had attended the first training academy to maximise the impact and reach of the programme.

The delegates also toured the national space centre, allowing them to explore how audiences can be engaged with human space flight.



## 2017 National Meeting and Visit to DLR and the European Astronaut Centre in Cologne (EAC)

On March 17th a national meeting for delegates of the 20 Destination Space delivery centres was held in at the European Astronaut Centre in Cologne. This meeting provided a unique opportunity for all centres to share their experiences of the programme and to be inspired by visiting the place where Tim Peake trained. 16 people attended the meeting and presented a short summary of how Destination Space was delivered in their centre.



The delegates then were taken on a tour of the EAC and DLR training facilities as well as visiting the DLR schools Lab and discussing methods of engaging young audiences with the wonders of human space flight.

Feedback from the trip included:

*"Trip has proved fantastic research and inspiration for future projects. Very eye opening"*

*"It's going to be brilliant going back to the Centre and being able to give first-hand experience stories."*

*"I now feel much more confident to talk to audiences about the training facilities used by the astronauts."*



## Reaching Wider Audiences and Other Opportunities

### Farnborough International Air show 16<sup>th</sup> & 17<sup>th</sup> July 2016

The ASDC project manager along with Tom Roberts from Techniquest delivered Destination Space activities at the families and public weekend at Farnborough International Air show. Assisted by a number of UK Space Agency volunteers, children and adults took part in a range of activities such as exploring how to control a robot arm, riding on a hovercraft, building and launching their own rockets, and exploring the International Space station using the Destination Space Augmented reality App. Over 800 people took part in Destination Space activities that weekend, engaging with hands on science that they could continue to explore with their families back at home.



## Bluedot festival 22<sup>nd</sup>-24<sup>th</sup> July 2016

The Bluedot festival was held at Jodrell Bank Discovery Centre and featured a blend of science, arts and music celebrating STEM.

A team of 4 Destination Space delivery staff including 2 ASDC staff and 2 of the development staff from National Space Centre, engaged over 1000 people with Destination Space activities. Adults and children took part in a range of activities, including building and launching their own rocket to the moon, controlling robot arms, experimenting with marshmallows in a vacuum and meeting the Destination Space astronaut.



## Principia Schools conference: Portsmouth 1<sup>st</sup> – 2<sup>nd</sup> November 2016

With the aid of staff from Winchester Science Centre and ASDC, Destination Space activities took part over 2 days at the Portsmouth Guildhall. On the first day, the Destination Space rocket workshop engaged over 100 school students with the physics behind launching a rocket.



They all built their very own rocket and launched it towards the International Space Station. Both students and teachers joined in and a range of modified rockets were produced, showcase the ingenuity of young minds to meet a challenge. On the second day the Destination Space show engaged over 300 KS1 and KS2 students with Tim Peake's mission and the wonders of human spaceflight, whilst busking activities at the main stand continued to engage young minds with the challenges of human spaceflight.

## Principia Schools conference: York 5<sup>th</sup> – 6<sup>th</sup> November 2016

Eureka! The National Children's Museum and ASDC engaged school and public audiences at the York schools conferences. Destination Space activities including the show and a range of hands on activities engaged over 1000 people during the two day event.



The team from Eureka also had the pleasure of meeting Tim Peake in person, providing them with a new lease of inspiration for the programme.

## Project Lessons Learned

Destination Space has far exceeded all expectations. The programme's success can be attributed to the enthusiasm of the delivery partners to be a part of the Principia programme and feel a direct part of Tim Peake's mission as well as excellent resources, equipment and scripts. These provided a firm foundation in training centres to feel confident to engage audiences with Tim Peake's mission.

Key Lessons learned:

- The modular nature of the programme was essential for science centres to have ownership of their own Destination Space programmes. Each centre was able to adapt the shows and workshops to meet the needs of their visitors whilst maintaining the core messages and values of the programme.
- Despite the unknowns of human spaceflight missions (changing launch/landing dates, spacewalk etc.) centres are able to adapt rapidly, however this reduces visitor numbers that given more publicity time could have been a lot higher for specific events.
- Factoring in replacements for equipment when the amount of use far exceeds expectations. The status of equipment when audience numbers far exceed expectation, should be monitored so that future programmes can learn from the equipment successes and limitations. The popularity of the Destination Space robot arms meant they were pushed beyond expected usage, resulting in units requiring constant maintenance.
- The 11-14 year old workshop had less impact on increasing the interest in a career in science than the 5-7 and 7-11 year old workshops with 55.6% of 5-7 year olds, 54.6% of 7-11 year olds and 41.7% 11-14 year olds stating that they were more interested in a career in science following a workshop. This may be due to 11-14 year old students already knowing about space science or being exposed to more space related scientific experiments. Any future space programmes should look into how 11-14 year old school workshops could increase impact.

## Project Summary and Conclusions

The Destination Space programme has now concluded its contractual deliveries and has been a huge success inspiring over 700,000 people across the UK with Tim Peake's mission and the wonders of human spaceflight.

The programme has left a last legacy in all 20 Destination Space science centres, with schools workshops now fully embedded into the centres schools programmes. The 20 delivery centres are planning to continue delivering the workshops and programme materials for years to come.

The feedback from the delivery partners has been overwhelming positive and they valued the opportunity to be a part of the Principia programme. Destination Space has not only provided the resources and knowledge to engage audiences with the Principia mission, but has also improved the level of confidence within science centres when discussing human space flight and the UK Space sector.

Feedback from audiences highlights that more young people are now aware of the range of careers available in the UK space industry and how important the variety of skills are when working in a team.

The science centres report that their visitor numbers increased throughout 2016 which they partly attribute to the Tim Peake factor and being able to be a part of this through the Destination Space programme. The centre staff also report that they are now more confident in engaging audiences with human space science and feel their space education programmes are now much more up to date than before.

The resources, materials and equipment that have been developed for Destination Space have proven highly effective and popular with a range of audiences and will continue to be utilised of years to come.

ASDC has thoroughly enjoyed the programme and would like to thank everyone at the UK Space Agency for their support and guidance over the past three years.

## Overviews from the 20 Delivery Science Centres

### Aberdeen Science Centre

The Destination Space programme was a huge opportunity to materialise the vision of ASC by providing families, school pupils and community groups with an inspiring, immersive and interactive programme of events. One particular highlight was a community event aimed at families from a rural area of Aberdeenshire which involved 43 participants aged 5-14 along with their parents, guardians and/or grandparents, who were inspired and enthused by a newly developed rocket workshop using the Destination Space rocket launcher. Without this outreach event these families would not have been able to engage with ASC, and in turn the Destination Space programme. Discovery Day in March was a brilliant success with a new record attendance of 1,203 visitors taking part in Destination Space: Join the Crew shows and Crew Training workshops. As expected, Tim Peake's return event on Saturday 18<sup>th</sup> June captivated visitors and



brought a new audience to the centre that had been following the Principia mission.

Promotional activities have helped create and maintain a high level of interest in ASC and specifically the Destination Space programme. For instance social media posts relating to Destination Space have reached 120,471 people on Facebook and 4 of the Centres top 10 tweets were about this programme. Destination Space has also

attracted media attention to the Centre, resulting in extensive coverage of all Destination Space activities.

The legacy of the Destination Space programme is assured as the Centre has incorporated many of the elements in its delivery, including a Space birthday party theme aimed at children aged 5-8, and the equipment will be used during World Space Week 2017 and regular Space on the Spot Demonstrations for all visitors to ASC.

Destination Space has been a wonderful opportunity for ASC to enrich its STEM delivery, strengthen collaborations with external partners, and, most importantly, increase the public interest in the Principia Mission, human spaceflight and the achievements of ESA Astronaut Tim Peake.

## At-Bristol Science Centre

At-Bristol Science Centre has certainly made the most of the Destination Space programme! Since World Space Week in October 2015, At-Bristol has shared, shouted-about and shown audiences of all ages just how exciting space travel can be. So far over 20,282 people have engaged with the Destination Space programme through watching, playing, laughing and learning all about Tim Peake's mission to the International Space Station.

Through the Destination Space family show, At-Bristol has inspired over 5,000 people. The show was delivered in At-Bristol's purpose-built, theatre-style Studio, to audiences of up to 120 people per show. Excited audience members were able to explore the challenges of microgravity with an indoor hovercraft, fire a real rocket with flammable hydrogen gas and, of course, find out what astronauts do when they need a wee on an eight hour spacewalk!

At-Bristol held events to celebrate Tim Peake's launch, and return both inside and outside the Science Centre. At-Bristol also screened Tim's full five-hour Spacewalk to a public audience on Bristol's Big Screen, all streamed live via NASA TV. Visitors to At-Bristol's Millennium Square watched in awe as Tim and his colleague stepped outside the ISS and completed their objective to replace a failed electrical box.

At-Bristol held five Giant Sleepovers as part of the Destination Space programme, two groups of Brownies and Guides and three groups of Beavers. Over 700 children took part!

In November 2015 and January 2016, At-Bristol ran Community Open Weekends to give families resident in Bristol's areas highest on the government's Indices of Multiple Deprivation the opportunity to visit At-Bristol at no cost. These families participated in Destination Space activities, including the family show.

At-Bristol started delivery of the Destination Space workshops for Key stage 1, 2 and 3 students in April 2016. The workshops have generated a high level of interest and during the reporting period the workshop has been delivered in At-Bristol to 2550 students and 130 teachers. The 50 free workshops that were included as part of the funding were advertised in our education brochure and allocated to schools from September 2016 onwards.



Feedback has been really positive, with many teachers commenting that it links well with and extends what is being studied in the classroom.

At-Bristol also held a Meet the Expert event for schools with Peter McGinty from the Department of Mechanical and Aerospace Engineering at the University of Strathclyde. Peter brought the Space for Art exhibition to At-Bristol, which examines how space technology is coming down to Earth to help humankind. Peter was on-hand throughout to engage students with some space-themed activities, and answer any questions they may have had. Over two days in June Peter engaged with 80 students.

Destination Space has enabled At-Bristol to engage all strands of its public and school audiences with an exciting suite of activities, events and communications (via variety of channels) that are bringing Tim Peake's mission to space directly into people's everyday lives!

### Cambridge Science Centre

Cambridge Science Centre (CSC) has been delighted to be part of *Destination Space*. The resources provided through this collaboration have helped the skilled science communicators at Cambridge Science Centre inspire families and schools in the centre in Cambridge and through outreach across East Anglia, sharing amazing stories of space-related science and innovation. Cambridge Science Centre was particularly proud to share Tim Peake's story with new audiences.

Participating in *Destination Space* has been a very successful experience for CSC. The programme has engaged more families and schools than expected, and CSC has developed shows and workshops which will form a critical part of the future offering for these audiences.

Especially pleasing has been the success of the interactive shows and workshops. These provided many opportunities for audience participation, ensuring that this activity retained crucial hands-on elements to directly engage children and their families with scientific principles and equipment. CSC has also taken this opportunity to offer practising scientists the opportunity to directly involve children and their families with their cutting-edge research.



*Destination Space* has enabled CSC to refresh existing partnerships, e.g. offering new activities in partnership with the Royal Society of Chemistry and to improve elements of its existing offering. For example, in 2015, CSC delivered its annual Chain Reaction as a hugely successful public engagement event for *Destination Space*.

A total of 17,055 children, families, teachers and students engaged with the *Destination Space* programme at Cambridge Science Centre - a significant portion of which being new audiences who had not experienced our work before. The gender split of visitors was close to 50:50, with a wide range of ages and diverse socioeconomic backgrounds. This is an important measure for CSC, as engaging new audiences from varied demographics is a key goal of the charity.

*Destination Space* will continue to be an important part of CSC's future. Shows and activities developed for this programme will become an essential part of the ongoing offering to schools and Cambridge Science Centre is grateful for the opportunities that the programme has opened up.



## International Centre for Life

Destination Space at the Centre for Life has engaged over 35,000 members of the public and 3,000 school students with human spaceflight and Tim Peake's Principia mission. The key events and achievements are listed below:

- Public events were held for Tim's launch into space and return to Earth.
- The popular 'Destination Space' show ran in the Centre for Life's theatre from September 2015 to January 2016 and was seen by nearly 20,000 people.
- School students chatted over Skype to ESA astronaut Jean Francois Clervoy at the project launch.
- A Family Space Day was held in January 2016 to celebrate all things astronaut-related.
- Tim's story and animations from the British Association of Planetaria were used in public shows between December 2015 and July 2016, and continue to be used with school groups visiting Life's planetarium.
- Various activities were held in Life's Making Space relating to human spaceflight, including one to celebrate Tim's birthday.
- Life's Science Explainer and Public Engagement teams received bespoke training with Anu Ojha of the National Space Academy.
- Two special evening events for adults were held on the theme of human spaceflight and celebrating Tim's time on the ISS.



- Copenhagen Suborbitals, an amateur spaceflight group, attended Maker Faire UK where they met over 5000 people to show their rocket and capsule and talk about getting people into space.

- A scale model of the International Space Station bought with additional Destination Space funding is now in permanent residence outside Life’s planetarium.
- The gender reach of Destination Space activities at Life has been approximately 50:50 male/female.
- Destination Space has been promoted through Life’s media channels, in print, online and on the air with online advertising, social media, local paper and magazine articles, printed marketing, teacher mailings and radio interviews.

### Dundee Science Centre (DSC)

Dundee Science Centre (DSC) has inspired and engaged families and school children with the amazing stories, science and innovative ideas of human spaceflight and the achievements of Tim Peake, the first British ESA Astronaut, through the delivery of its schools programme, interactive shows, activities and special events within DSC, Dundee and Fife Science Festivals and through outreach events reaching a total of 38,093 people.

To date, over 31,390 visitors to DSC have taken part in the Destination Space family show. DSC has also used the Destination Space project as part of the outreach programme to engage with ‘hard to reach’ groups by delivering free public outreaches to community groups in areas of high deprivation, through its core community engagement programme and also Dundee (2015 and 2016) and Fife (2016) Science Festivals. DSC invited families, schools and community groups to mark moments in history by taking part in two special events celebrating Tim Peake’s launch to the International Space Station (ISS) and his return mission.

Throughout these events participants took part in Destination Space shows and activities, got the chance to meet experts in the field and watch live footage of Tim’s mission. Dundee Astronomical Society shared their knowledge and passion through interactive demonstrations and participants joined Cosmos Planetarium on a tour of the ISS.



In order to make the events more accessible, free tickets were issued to families and groups from areas high on the Scottish Index of Multiple Deprivation (SIMD), removing the financial barrier of admission costs. In the lead up to these special events DSC’s team delivered outreach activities within community settings to build relationships with group members and encourage their participation with the Destination Space project.

To celebrate Tim’s Principia Mission, DSC also managed to secure a Tim Peake themed Oor Wullie sculpture, called Astro Wullie. The sculpture was part of Dundee’s “Oor Wullie’s Bucket Trail”, where over 50 unique sculptures dotted around the city of Dundee formed a trail during summer 2016 for tourists and the people of Dundee to track down. The sculpture proved to be highly successful and our involvement with the bucket trail in its time at DSC highlighted the importance of Tim Peake’s mission.

Since the introduction of the Destination Space workshops, DSC has engaged with over 2,585 local school pupils (with a 50/50 gender split) and teachers and a further 1,005 through special events such as the launch event and those held as part of Dundee Science Festival 2016. The feedback received on these sessions has been overwhelmingly positive.

Over the course of the project DSC worked closely with its PR agency and communications team to create a specific social media campaign encouraging people to 'Join the Crew' online and to generate coverage in local newspapers and radio to raise awareness about the Destination Space project.

## Dynamic Earth

The Destination Space programme at Dynamic Earth has exceeded all expectations: over 43,000 individuals have taken part in a variety of activities, workshops and events against an original target of 8050. The success of the programme can be attributed to its flexibility, broad subject appeal, high quality resources and inspirational stories. The science and ideas behind human space flight and Tim Peake's Principia mission proved highly appealing to the different audiences who access Dynamic Earth as well those engaged via outreach. This included a mix of families, school groups and other community groups traditionally thought of as "hard-to-reach" and who would usually be less likely to engage.

Feedback received across the programme has been uniformly and overwhelmingly positive. Comments from some individuals reflected considerable changes in perception whilst large numbers of people reported being inspired by the programme and expressed a keen desire to discover more.

Family audiences were engaged throughout the project from prior to Tim Peake's launch right through to a visit by the astronaut himself on his Principia post-flight tour in October 2016.

The Dynamic Earth Learning Team delivered a mix of public engagement workshops and activities throughout the period. This included a full 8 week summer programme in which young children experienced storytelling sessions in a specially created and themed soft play area and families and adults were offered a mix of drop-in activities and mini workshops on the themes of space travel, robotics, rocketry and life in space.

School workshops were delivered to approx. 1,500 pupils, both in English and Gaelic, and the workshops remain as a popular choice in Dynamic Earth's formal education programme. A specially curated Earth Observation Careers Day in March offered 120 secondary pupils insight into the work of scientists and jobs available in this field.



Outreach beyond the centre included engaging local audiences e.g. at after school clubs and also at family days e.g. in partnership with the BBC at the Edinburgh Fringe in August 2016. The programme was taken across Scotland and delivered to some remote and rural communities as part of science festivals from Dumfries and Galloway in the south west to Shetland in the far north.

Destination Space was also delivered as part of Dynamic Earth's community programme which gives tailored support to encourage those who may otherwise be unlikely to visit. Numbers for such specialist activity are relatively low but the benefits to the individuals involved are considerable. Some activities have been delivered in the traditional workshop format; others were a creative mix of science and craft. For one community organisation supporting adults with physical and learning disabilities, Dynamic Earth teamed up with a traditional Scottish felter to deliver a term long Destination Space engagement programme merging arts and science.

Overall, the inspirational story and cross-STEM appeal of Destination Space, coupled with a toolbox of activities, training and unique experiences, has allowed Dynamic Earth to deliver one story across many audiences and, and perhaps most significantly, to reach out to new ones.

### Eden Project

Eden project ran a bespoke programme of events over a shorter period as we were not able to run the Destination Space programme over the entire timeframe. We started on December 15th celebrating Tim Peake's lift off to the International Space Station, then Eden hosted two space-themed weekends and four specific school days giving children, schools and families the chance to discover even more about Tim Peake's mission and work. Our last piece of work for was at Port Eliot Festival on 28th July where we ran 'The show' for a completely different audience - festival goers! The content provided this audience with a direct connection to the UK mission, along with covering Eden's Destination Space Key Messages; Protecting and understanding our world and our long-term survival, Inspiration, Exploration and New Technology.



Port Eliot Festival, held in the grounds of the Earl of St Germans Cornish estate at Port Eliot in Cornwall unveiled a new stage for their 2016 festival; The Port Eliot Science Lab – the result of collaboration with fellow South West institutions - the University of Plymouth and the Eden Project, as well as the British Science Association. For the duration of the festival, the most startlingly unusual room in the House at Port Eliot, the Round Room, became the festival's first science lab, exploring science, hosting performances and inviting the audience to perform experiments and witness new developments in action. Experiments, lectures and debates filled the room; an all-too-rare opportunity to chew over astronomy, Tim Peake's mission, bio-hacking, the science of sleep and memory.

The Eden Project set up the Destination Space programme at Port Eliot on the evening of Friday July 27th. The following day, two of Eden's talented storytellers dressed in authentic space suits, delivered interactive demonstrations that gave the audience the chance to learn about space exploration and Tim Peake's International Space Station mission, along with how rockets make it into space and how the astronauts get home again.

The Launch event and themed weekends at Eden were a great success. Eden Project is planning the 2017 summer programme; it is most likely to be Space. This will be a fantastic opportunity to work with ASDC and use the Destination Space narrative and activities as a possible starting point.

### **Eureka! The Children's Museum**

Since December 2015, Eureka! The National Children's Museum in Halifax has engaged 23,747 children and adults with the Destination Space programme through family activities, school workshops and special events.

Family visitors on weekends were able to take part in the Destination Space family show and on selected weekends the programme was enhanced by experts who provided hands-on demonstrations and answered questions about space exploration and human spaceflight. Destination Space was also the focus of February half term activities 2016 which was one of the busiest half



term holidays Eureka! has experienced in recent years and during the fortnight more than 6,000 people watched the family show.

Primary school groups were able to book the Destination Space workshops throughout the Spring term 2016 and also during World Space Week in October 2016. Both KS1 and KS2 bookings exceeded expectations in the Spring term with almost 3,000 children taking part.

Eureka! also provided free access to the museum and the Destination Space programme for a number of local schools from low science capital areas.

Both family and school groups were engaged with the Destination Space show and associated activities at the York Principia Conference which was attended by Tim Peake himself. This was a fantastic event and it was amazing to see how inspired and enthused children of all ages have been with the Principia mission and following Tim's progress.

Where it's been possible to track the gender split amongst child attendees, statistics show that overall slightly more girls than boys have engaged with activity at Eureka! This is largely due to the volume of Brownie groups who have attended special events and evaluation from these groups has shown that 94% of girls agree that Eureka! is a good place to learn about science in a different way to school.

Eureka!'s total number of participants (23,747) far exceeds the minimum requirement for both total visitor engagement and those attending in formal school groups. Some areas of the programme exceeded the original target such as the family shows over February half term, school workshop bookings and the Home Educator Day, all of which attracted more interest than anticipated and led to extra sessions being scheduled to satisfy demand. However due to necessary readjustments in forecasted numbers based on programme content and timing of national events such as Tim's return, the total participants reached does fall short of the museum's original target of 35,658.

The whole experience of developing and delivering the Destination Space programme at Eureka! has been extremely positive. Staff have been able to increase their knowledge and skills which can be put to good use in future space related programming and many have been inspired by the achievements of Tim Peake, following his progress with keen interest. Visitors too have thoroughly enjoyed the activities on offer and it's been clear throughout the year that Tim has captured the imaginations of so many people, young and old, and truly been an inspiration to all.

### Glasgow Science Centre (GSC)

Glasgow Science Centre (GSC) launched 'Destination Space' in October 2015 during our World Space Week celebrations. GSC have run an impressive portfolio of activity, engaging with a total number of 87,713 public and school groups between October 2015 and November 2016, exceeding initial projections on reach and impact of the project. GSC has run a highly successful public learning programme including extensive delivery of the Destination Space Science Show in our Science Show Theatre and space themed drop-in activities, telling stories of Tim Peake and the science of space exploration. This alone has engaged with 25,092 members of the public throughout the reporting period. Glasgow Science Centre's Planetarium Team have run special Planetarium shows focusing on the



International Space Station and Tim Peake's Principia mission, and we have hosted experts from academia and industry to connect our visitors to real space research happening in Scotland.

Completing our public programme has been a series of special events for school groups, community audiences and uniform groups. GSC held a hugely successful rocket launch celebration for Tim Peake in December 2015, in which over 500 pupils and teachers watched Tim Peake blast off in our IMAX Cinema, Science Show Theatre or the Auditorium Theatre, before experiencing a wealth of other Space themed activities. GSC held a special screening of Tim's Spacewalk in January 2016 for our public and education audiences. To mark Tim Peake's return we showed Tim Peake's landing on our big screen outside GSC which was viewed by both visitors and passers-by.

In addition to public and education targeted programmes, GSC held specific Destination Space events including a Community Open Weekend in February 2016, which saw 30 families from deprived areas engage with the Destination Space show and our associated space themed Tim Peake programme. GSC hosted 5 'stellar sleepovers' including 3 for Brownie and Girl Guiding units ensuring we engaged with 2,080 girls and young women in STEM and the Destination Space programme.

One of the legacies of Destination Space has been the installation of three new exhibits at the end of June 2016 in the newly refurbished Space Zone, 'Dressed for Space', 'A view of Scotland from the Cupola – the largest window in space' and 'Spacesuit gloves' which significantly add to the area where visitors queue for Planetarium shows.

### **Jodrell Bank Discovery Centre**

Destination Space at the Jodrell Bank Discovery Centre has been an extremely successful project for visitors, school students and staff alike. During the academic year 2015/16 the family science show was the primary visitor engagement during our busiest periods of the year; October and February half terms and 'post Stargazing Live' weekend in January. During these times over 7,700 visitors saw the show. It was extremely well received by all ages and was enjoyed by delivery staff alike. 92% of surveyed children (between ages 3 and 13) reported that they were more likely to choose to study science after seeing the show.

The content of the Destination Space project differs from our usual remit of radio astronomy, but has proved to be relatable and inspiring for our visitors. Various hands-on activities from the project have been utilised in other areas of the Centre's delivery, such as our flagship Girls' Night Out event, other school holidays, and as part of our provision for badged groups (e.g. scouts).



Starting in May/June 2016, the Discovery Centre began offering the schools workshops to visiting school groups. The workshops have quickly become an important fixture in the Centre's education provision. To date, they have been delivered to 4,508 students and in the most recent term (September to December 2016) a third of all visiting pupils at the Centre experienced a Destination Space workshop. The Key Stage 2 Destination Space schools workshop is now the third most delivered workshop at the Centre. Feedback from the schools workshops has been overwhelmingly positive from both teachers and pupils, which can be seen in the Centre's submitted evaluation data. The Centre's own teacher evaluation (collected between September and December 2016) shows that 100% of responding teachers rated their

students' learning as good or outstanding during Destination Space workshops. All teachers said the workshop met or exceeded their expectations, and that they would recommend the workshop to other teachers. Jodrell Bank Discovery Centre has also been engaging the public with the project online, through our website and social media. Facebook posts relating to Tim Peake proved to be very popular, with an average reach of 4,700 per post; 27% higher than the average for other Facebook posts.

The staff at Jodrell Bank Discovery Centre have enjoyed delivering the Destination Space materials. The quality of the equipment and the access to special items (such as astronaut food and ATV solar panels) have enabled the Discovery Centre to deliver a very high-calibre engagement experience for visitors. Destination Space will continue to be delivered as part of the Jodrell Bank Discovery Centre education programme past the end of the project.

### National Space Centre

The Destination Space project has been a key part of the National Space Centre's programmes throughout the duration of the project and has provided the centre and its visitors with a variety of ways to engage with Tim Peake's mission and subsequent activity. Tim's popularity



with both family and school audiences has been incredibly high and he has become a key figure that the centre can use to engage the public with space and science topics. The inclusion of Destination Space content within the centre physically and as part of educational workshops will be an enduring legacy of Tim's mission



and hopefully inspire many to engage with science and space at all levels.

The National Space Centre is the UK's only science and discovery centre dedicated to space science, exploration and technology. The Destination Space project has enhanced the experience that it has been able to offer both to school and family visitors. Tim's mission has been one of a number of missions that have raised the profile of space-related topics in recent years and now the National Space Centre is finding that its biggest challenge is catering for the increase in visitor numbers to the centre. National Space Centre staff have been excited to welcome greater numbers than ever before and are working hard to ensure that the visitor experience doesn't suffer as a result of limits on capacity. Content relating to Tim and to Destination Space has been built into the National Space Centre's exhibition space and special events programmes to reflect the high level of interest from our visitors, meaning that Tim and his mission enjoy a high profile within the centre.

### Observatory Science Centre

The Destination Space project has exceeded expectations, providing a valuable addition to The Centre's programme of events and activities. Overall 37,497 people have engaged with the project, 9,462 more than anticipated.

The workshops and shows have been especially well received by schools and both were the main focus of British Science Week. Great appreciation has been shown for the support to learning topics, especially cross-curricula activities in workshops which include forces and materials as well as space exploration. The workshops have been adapted to fit the Centre's needs and the children's attention span.

Planetarium presenters have shown video clips of the Principia mission docking with the ISS and these have been presented alongside schematics of the ISS explaining the various units and what they are used for. Including Destination Space within the planetarium programme has meant that even more school children have been engaged with the mission and know who Tim Peake is.

The Family show was presented at key times only prior to the summer of 2016, for example during the October half term 2015, when Tim returned to Earth and on activity weekends. Over the summer holidays 2016, 12,000 visitors engaged with the show, 4,000 more than predicted. It has been very well received. A few modifications were made to the original script but the show continued to make use of up-to-date video clips keeping everything vibrant and fresh. Staff members thoroughly enjoyed being part of the project; adding their own personalities to show presentations.

Key events through the project have included taking the Sokol suit and



robotic arms to St Richards College Bexhill, on the day they had a live radio link-up with Tim. This was very exciting and primary school children from the local area were also invited.

An expert, Robin Mobbs from the National Space Academy gave such excellent interactive talks during the pre-launch weekend in December that he was invited back to speak again at a dedicated Cheese and Wine event for adults who were riveted by his dialogue.

Stargazing events were not as well attended as hoped due to poor weather but visitors were still engaged through both the dedicated notice board explaining Tim's mission and planetarium style talks. 'Drop-in and Dress-up' activities proved popular and were introduced again during the activity weekend to mark the end of British Science Week. This reinforced the fact that there are many job opportunities in this sector and you don't have to be an astronaut to get involved. Activity weekends specifically dedicated to the project included building a model of the ISS and rocket launching which proved popular.

Overall, Destination Space continues to be an excellent project and has really brought the life of an astronaut to everyone's attention; piquing the interest of all ages and abilities, especially exciting children with the prospect of human spaceflight.

### **Royal Observatory Greenwich (ROG)**

ROG's experience throughout the Destination Space programme was overwhelmingly positive. In terms of our formal learning programme, we have now completed all of our Destination Space themed Space Spectacular weeks which ran in October 2015 as well as March and July 2016. The science theatre show that we performed for part of the week utilised much of the equipment provided by ASDC. The show was received particularly well by primary school audiences because of its visually entertaining and interactive content.

The planetarium show insert and micro show titled *Peek at Peake* has driven engagement for our audiences across the board by not only providing visually stunning views of the Earth and the ISS, but also inspiring questions from the audience after the shows. In November our planetarium astronomers received amazing visualisations of the International Space Station from the National Space Centre, which have been integrated into *Peek at Peake* providing presenters with flexibility in content to show depending on the latest news about Tim's Principia Mission. The planetarium is also an excellent medium to use to demonstrate how to spot the ISS in the sky and our presenters updated each audience with viewing times for the next ISS fly over and exactly where to look for it.

The Royal Museums Greenwich press team has been hard at work to field enquiries relating to Tim Peake and the International Space Station. Across just a few months, staff from the Royal Observatory Greenwich have participated in numerous interviews to talk about Tim Peake, the Principia Mission and the International Space Station. Between October 2015 and July 2016 the audience reached with these interviews was 14,350,000 people world-wide.



The Weekend Space Cadets workshops were composed of young families and our team of Observatory Explainers successfully engaged them and occasional brownies and cubs groups in Tim's Principia mission. Many visitors happily took advantage of the photo opportunity of wearing the space helmet alongside Tim's cardboard cut-out. The current team of Observatory Explainers is made up

of undergraduate and postgraduate students in astrophysics who can share their knowledge and passion with the next generation of astronomers and space scientists and give older children an idea of what it's like to study a science subject at third level.

ROG held a sleepover event with Girl Guides and Brownies whose structure and format was decided months before the Destination Space project, but whose content was not. We therefore took advantage of this opportunity to theme the planetarium shows and workshops on the night around Tim, his mission and his return to Earth that day.

The Royal Observatory are proud to have been part of this project and to share our genuine enthusiasm about Tim and his Principia mission with all our audiences.

## Science Museum

Here at the Science Museum the Families and Accessible Programmes team delivered the Destination Space Show over the period of approximately six months from December 2015 until Tim Peake's return in the middle of June. The original KS2 show was adapted into a 30 minute show aimed at families with children aged five and over. The show was performed multiple times a day during school



holiday periods; the museum is very busy during these times and we knew that there would be the uptake for it and sure enough our show space was consistently full. This family show was also performed every weekend, either once or twice a day during the period Tim Peake was in space.

Developing and delivering the show was a new and interesting challenge for the team. It was exciting to work with different centres and good to develop something collaboratively with the involvement of prestigious organisations such as the UK Space Agency and ESA.

The reaction from the public was overwhelmingly positive; children were consistently engaged with the show and would stay behind to ask follow-up questions at the end. Questions such as

“how old do you have to be to be an astronaut?” were frequently heard, both children and parents would express how impressed they were with some of the experiments. The variety of the experiments chosen worked well and each individual experiment was strong. We could tell by looking at our feedback; when we asked visitors to choose a favourite, almost every answer was different! Overall the show worked well and we definitely enjoyed performing it.

## Techniquest

Techniquest was delighted to be one of the 20 partner science and discovery centres selected to deliver ‘Destination Space’, the ASDC National Astronaut Programme for families, schools and communities celebrating Tim Peake’s mission into space.

Techniquest’s engagements began on Launch Day which was widely promoted beforehand. Members of the public were invited to an evening event packed full of space-related activities. As well as the launch of the ‘Destination Space’ Family Show, visitors could also see Food in Space show in our Planetarium, watch a 3D Astronomy film, take part in a Rockets Workshop, program a Mars Rover and try out some space busking activities. In addition to these, organisations such as the UK Space Agency, Institute of Physics, Cardiff Astronomical Society, Cardiff University, Airbus, Into Film/Turnipstarfish and the Radio Society of Great Britain all had interactive stands to entice families. Techniquest was also honoured to welcome astronaut, Pedro Duque, who added great gravitas to the evening by delivering a pre ‘Destination Space’ show talk and offering a Q & A session with visitors as well as graciously accepting numerous photo requests! 325 people attended the Launch evening and there was a palpable buzz of excitement and anticipation waiting for Tim to enter the ISS. All visitors were very positive in their feedback with one family stating that we had “excelled ourselves” as they left.

January saw the start of Techniquest’s school engagements with deliveries of the KS2 Destination Space workshop which has proved very popular. The workshop was offered to schools at a subsidised rate as a result of the ASDC/ UK Space agency funding creating an overwhelming demand because schools were so interested in such a topical workshop. To date, 8,116 pupils have participated in this KS2 programme.

On 15<sup>th</sup> January, Tim Peake completed his first Spacewalk and Techniquest made the most of this opportunity by inviting pupils from a local primary school to watch Tim’s spacewalk here live and also to participate in a ‘Living in Space’ workshop in which they work in teams to build their own model of the ISS. 30 Pupils from a local Community School attended the Spacewalk event.



The Destination Space family show started its run in the Techniqest theatre in January and bookings for the show during weekends in the February half term holiday were extremely high. The family show was also part of British Science Weekend on 19 & 20 March and returned for a final weekend on 18 & 19 June to celebrate Tim's Return.

Our 'Space Adventures' Toddler Day in January was also a great success and high numbers of 386 people attended our Space Toddler Day.

Brownies and Cubs attended to work on their space badges and to learn more about the Principia Mission. A total of 491 Brownies and Cubs took part in our space related activities.

In summary, 'Destination Space' proved an overwhelming success.

### Techniqest Glyndwr

Techniqest Glyndŵr embraced the Destination Space project with staff in all areas of the centre - delivery, booking, marketing etc. - enthused by the project. The enthusiasm continued throughout the project with staff able to link the theme with many deliveries both in and out of the centre.

Staff were keen to learn about the project and Tim's journey into space, especially the preparation and recovery involved with space flight. Staff developed a knowledge that allowed them to make links between the exhibits that are permanently housed at Techniqest Glyndŵr and the Destination Space project, and staff continue to use this new knowledge in explaining STEM concepts to visitors to the centre.

The project was rolled out to schools and family audiences throughout the year. The family show has been integrated into the established, varied public programme that Techniqest Glyndŵr has running during weekends and school holidays. The family show was promoted during busy school holiday times to engage new audiences. So far the show has run alongside the 'Spooky Science' Halloween themed show and



the 'Horrible H<sub>2</sub>O' show in February half-term 2016. These shows were already on the programme before the project started, so it provided Techniqest Glyndŵr with an opportunity to bring space related activities to an audience who may have decided to visit the centre primarily for the other show. The show was also the main weekend and holiday show in January and February 2017 for public and birthday party audiences.

The schools element of the project has been promoted to schools in Techniquest Glyndŵr's catchment areas as an exciting new activity that schools can book alongside activities from the core programme. Schools are being encouraged to continue to make bookings throughout the school year. The ever popular StarDome Planetarium provides a great second activity to enhance excitement about the topic of space.

## Thinktank

The Destination Space program at Thinktank was a huge success for both family audiences and schools' audiences that visited the museum between December 2015 and January 2017.

Members of the public had access to a family show during the Christmas, February and Easter school holidays and a range of public programming during the holidays and weekends whilst Tim Peake was in space. On his return the programming side was stopped, but the messages of the programme were continued with special events such as dedicated Destination Space Sleepovers, and access to some of Tim's pictures from space.

Using the images that Tim released on Flickr, staff members chose their favourites based on personal opinion and memories of the mission, to be displayed to the public. This commenced with a large amount of images in a rolling slideshow projected outside the planetarium, and then complimented with high resolution images exhibited in the museum from the 23<sup>rd</sup> September 2016 to the 31<sup>st</sup> December 2016.

The schools' programme that was supplied with the project has become a permanent part of the learning offer at Thinktank, with each element receiving large numbers of bookings and great reviews from both students and teachers. The Key Stage 1 show has proven so popular that a second kit has been purchased, enabling it to be run both in-house and on outreach simultaneously.



The additional funding that was made available has also led to some key learning experiences with schools being able to book sessions using Astro Pi's similar to the ones used in space. This session is a great introduction to coding and how people on Earth can get involved in space science. The additional purchase of paper rocket launching kits has led to fun hands-on sessions linking both to space exploration and engineering design.

Destination Space has been able to offer an inspirational and exciting range of stories and current science that has captured the imagination of the public, school students, and members of Thinktank staff. It has also highlighted career opportunities within the Space Industry, and has been a source of great contemporary science information.

The legacy of the project will be seen in the continuation of the schools' workshops and shows as a key component of the learning offer both at Thinktank and on outreach. The public programming and resources will also be used in conjunction with the programme for summer 2017 which is focusing on the moon, space exploration, and the beauty in science.

Thinktank will link the Destination Space key messages of ‘engaging, inspiring and involving UK families with amazing stories, science and innovative ideas of human spaceflight and the achievements of Tim Peake, the first British ESA Astronaut’, with an art exhibition by Luke Jerram entitled ‘Museum of the Moon’, and a stand-alone art work entitled ‘Totality’ by Katie Paterson showing nearly every Solar eclipse recorded in history.

## W5

The Destination Space programme has been a very positive experience at W5. It began with training in September 2015, followed by a period of preparation ahead of Tim Peake’s launch on December 15<sup>th</sup>. Prior to this, W5 began delivering the DS family show in October, tying in with World Space Week. Preparations for the launch became progressively busier. In spite of it being so close to Christmas it turned out to be a great success and on Launch Day W5 hosted 10 schools from across Northern Ireland and one from the Republic of Ireland. This totalled 451 pupils. An equal number of members of the public also attended during the day. ESA Astronaut Jean Francois Clervoy was a guest and contributed immensely to the day’s success. W5’s launch event filled the entire centre with a positive energy which rubbed off on everyone. From blast-off to docking it was a great day.

A large part of that success was due to the collaboration with other agencies who came in to W5 to help. The UKSA, Queen’s University, ESA and the NI Science Festival among others were all involved.



The Destination Space family show became an established part of the regular W5 rota of floor shows. It was popular and from October 2015 to January 2017 a total of 241 regular family shows were performed to an audience total of 6873 in W5. Audience sizes varied from just two to 120 at busy times such as Halloween.

A total of 64 Destination Space workshops reaching 1687 students were facilitated between April 2016 and January 2017 making them among W5’s most popular workshops. 22 of the workshops were for Key Stage 1, 25 were KS2 and 17 KS3. Schools came from a wide geographical spread across Northern Ireland with a fairly even gender split, especially at primary level. In January 2017 the KS1 and KS2 workshops were taken on five outreach visits to local schools in areas of low science capital. These were also very successful.

As well as Launch Day there were many other special DS events at W5. The huge momentum of interest created by the launch was maintained by coverage of Tim’s space walk in January, the RSC Mission Starlight Experiments in February, primary school visits with a Destination Space-funded Stardome featuring footage of the Principia mission and of course the Tim Peake

return day on 18<sup>th</sup> June. Though the timing of this event was difficult it nonetheless generated significant interest.

A major highlight of course was Tim's visit to W5 in October 2016. Although this happened at very short notice and time was short it proved a perfect bookend to the launch, with many of the same schools attending and finding their enthusiasm for all things space-related renewed once again.

Destination Space also had an impact at other events which W5 attended over the last year. In January 2016 W5 took the DS show to the BT Young Scientist event in Dublin. It was performed on the grand stage six times reaching an audience of 2800 over three days.

Destination Space has a legacy at W5 and will continue to be a part of W5's ongoing provision of science education.

### Winchester Science Centre

The Destination Space program has grown from just one aspect of Winchester Science Centres diverse educational offering, into one of the Centres most popular activities. The past year has seen a dramatic increase in schools interest in the program, partly due to the 'Tim Peake effect' and associated media but also resulting from the quality of the resources and



in-house delivery team. The program vision of 'engaging, inspiring and involving UK families and school children with amazing stories, science and innovative ideas of human spaceflight and the achievements of Tim Peake, the first British ESA Astronaut' has been successfully embedded in the Centre and has resulted in the achievement of all agreed-upon targets. 16,926 persons, including 4,395 school students have engaged with the program which represents a substantial increase on the numbers contracted.

Since beginning the programme 134 Destination Space themed events have been carried out, with 593 responses to evaluation methods. The Destination Space Family Show alone has been delivered at least 143 times and was the focus of the February 2016 report's case study due to the substantial refinements made by the Winchester Science Centre team. Special events have attracted 2,193 persons and the 'Welcome Home Tim' live event was the focus of the July 2016 case study.

The Science Centre added both the Destination Space KS1 show and KS2 workshop to its extensive portfolio of high quality in-house workshops and combined, these have been delivered to 3060 school students and teachers. Both sessions and the KS3 workshop were advertised to 1784 primary schools and 289 secondary schools in Hampshire & the Isle of Wight, London and surrounding counties. Over the programme period 3 % of advertised-to primary schools have since taken part in a Destination Space activity.



Due to lack of demand it was decided that the Centre would not deliver the KS3 workshop and has instead absorbed the resources supplied for this workshop into its new flagship zone dedicated to visitor-driven problem based learning; The Invention Studio. Both KS1 and KS2 sessions have proven to be highly successful, scoring on average (out of six) 5.4, 5.2, 5.3 and 5.3 for Overall Experience, Relevance to the curriculum, Equipment and Delivery respectively. The success and popularity of these two sessions has led to their modification and addition to the long-term offer of the Centre – ensuring a legacy for both the programmes resources and vision.

Since the July interim report the Science Centre has also hosted a special World Space Week (October 2016) programme of activity which involved a further 517 KS2 students with Destination Space activities as well as wider UKSA and ESA missions via external contributors from Airbus. Centre staff were also present at the Principia Schools Conference in November 2016 where they presented the Destination Space Family show, rocket maker workshops and an interactive stand. Cardboard cut-outs of Tim Peake have been the focus of numerous engagements with the public and social media as well as having being clearly visible for 203,523 visitors and members of public between the 23<sup>rd</sup> October 2015 and 19<sup>th</sup> January 2017.

### World Museum (Liverpool)

Destination Space has been exciting, challenging, and taken us in new directions. It has opened new doors and enabled us to seize exciting opportunities. We have delivered a truly inspiring programme to over 30,000 visitors, in addition to the 480,000 who viewed the Cosmic Classroom on line, which has provided unforgettable experiences for young and old alike.

An amazing highlight was hosting the Cosmic classroom ‘in flight video call’ to Tim Peake on the International Space Station. Tim only agreed to make one phone call to school children during his time on the ISS so we were honoured that the UKSA and TES invited World Museum to host the call. Over 11,400 schools applied for the 12 slots available and the call was viewed live by over 480,000 school children across 58 different countries.



Central to our strategy has been partnerships forged with other organisations, adding an extra level of depth, vitality, innovation, expertise and variety to our Destination Space offer. It has enabled us to work with amazing role models from the world of science. Partners have included: the Astrophysics Research Institute of Liverpool John Moores University, the School of Sport and Exercise Sciences of Liverpool John Moores University, Department of Computer Science of the University of Liverpool, TES, the UK Space Agency, Liverpool Astronomical Society, Chester Astronomical Society, Runcorn and Widnes Astronomy Group, Mission X, MERSEYSTEM. We are confident that these relationships will bring lasting legacies to National Museums Liverpool

Development and delivery of the Destination Space family show has been a key part of our programme. Our education team has delivered this as a show, and a busking activity. We have delivered stargazing events, a meet the scientist event, a schools event celebrating Tim Peake's launch and a celebration of Tim's safe return to earth. Destination Space has been a major opportunity for extending a space based schools engagement programme at Key stages 1 and 2. The team's confidence in teaching about space has grown with their experience and whenever possible the approach has been to work with external partners to increase the breadth and depth of the programme.

Press Coverage for our activities and events has been excellent with all the major TV companies and local radio and press descending on World Museum. A legacy of the programme will be our commitment to continue working creatively with the above partners to enhance our space themed educational work as well as an enriched programme.

# ANNEXES

## Annex 1: Events at Science Centres Celebrating Tim Peake's Launch into Space

On the 15<sup>th</sup> of December Tim Peake blasted off from Baikonur to spend 6 months living and working on the International Space Station. 13,247 people around the UK attended Destination Space launch events held by our 20 delivery partners, of which 3 were UK Space Agency organized launch events around the UK. The feedback was highly positive and people both young and old were mesmerized as they saw the Soyuz rocket lift off. Many of the delivery partners linked with the programme, reported they felt exceptionally inspired by the launch, and felt they had a personal connection with his mission due to the level of information provided by Destination Space. The following are short summaries of each centre's launch day activities.

### Aberdeen Science Centre

Aberdeen Science Centre provided its visitors with the opportunity to be part of Tim Peake's launch into space. For this free event, the centre invited two schools and the public to view the live launch and to participate in a variety of space-related activities:

- Live Launch on a big screen
- Destination Space – Join The Crew show
- Space on the Spot (hands-on science demonstrations)
- Planetarium Show (ESA clips narrated by one of the STEM communicators)



### Feedback

The launch event went extremely well and the excitement was palpable! The centre resonated with loud clapping and cheering as Tim blasted off at 11:03.

Children commented that the launch was “really cool” and asked lots of questions about life in space and how to become an astronaut. The narrated ESA clips really helped the visitors understand the Principia mission and life on-board the International Space Station, and feedback given was extremely positive. Overall, this launch event was a great success, attracting an audience that would not normally visit the centre on a week day and with the bonus of an unprecedented level of press interest. The enthusiasm of the visitors, centre staff and guests exceeded all expectations.

### At-Bristol Science Centre

At-Bristol held events to celebrate Tim Peake's launch into space both inside and outside the science centre. Inside At-Bristol Science Centre, visitors including Home Educator families enjoyed a fabulous view of the launch from the Planetarium. They were also treated to a bespoke planetarium show and to a special show created by the National Space Centre.

Outside the venue, members of the public gathered on Millennium Square to watch Tim's launch live on the Big Screen. At-Bristol team members, dressed as astronauts, offered them hot chocolate (it was cold!) and special space-themed snacks. Photographers and broadcast journalists added to the buzz of the occasion, capturing the excitement of the crowd – and the all-important countdown – as Tim's rocket launched.



### Cambridge Science Centre

For the 'Tim Peake Launch event', Cambridge Science Centre invited local Home Educating families into the centre to take part in a range of mission linked activities. The event provided the opportunity for a soft launch of the Destination Space: Skills for Space workshop, so children started by completing the workshop.



This was followed by a Q & A session with our rocket-launching specialist Jon London who has over 10+ years' experience delivering multiple rocket launching workshops. Families then watched the launch on the centre's big screen and had time to explore the space themed exhibits. 40 children took part in the workshop and we had a total of 90 people attend the event, which is maximum capacity for the centre!

### International Centre for Life

On 15<sup>th</sup> December 2015, Life celebrated Tim's launch into space with a fairly small and informal gathering of visitors, owing to it being the last week of school term before Christmas, and some parts of the centre being in use for corporate events. Most of these were families who home educate their children. Around 50 people gathered for the launch itself, which was shown on a pair of giant TV screens in the science centre and narrated by a member of the Public Engagement team. Activities, print materials and relevant objects were then available throughout the day with a member of staff on hand to demonstrate and keep visitors informed of what was going on. A few hardy souls stuck around to watch the Soyuz docking with the International Space Station.



## Dundee Science Centre (DSC)



DSC's team took to the airwaves for a live radio interview on the morning of Tim Peake's launch, talking about Tim's Principia mission, the Destination Space project and encouraging listeners to come along to the special launch event.

DSC welcomed 105 pupils and 16 teachers from three local primary schools to watch Tim's launch live. The event started with an extended version of the Destination Space family show, including

extra details on a number of demos including the Sokol suit. The BBC Stargazing Live feed was projected on a big screen for the build up to the launch. The event had a very excited atmosphere of celebration, and DSC's team joined the school groups to watch the launch marking a moment in history. Following the successful launch, the ascent was screened, and then groups split up for different activities: learning more about the ISS and how to spot it in the night sky; and learning more about rockets and launching a water-bottle rocket outside DSC.

DSC opened its doors free of charge in the evening for a special celebration event to screen Tim Peake's docking with the International Space Station. Visitors got the chance to explore the science centre, experience a modified version of the Destination Space show, take part in 'Explore your Universe' and science busking activities including meteorite handling, witness a Magic Planet tour of the solar system and helped DSC's team to launch their own rockets. Experts from Dundee Astronomical Society shared their knowledge through interactive demonstrations and Cosmos Planetarium attended with their dome show about the ISS. The docking was screened live throughout the centre with narration and demonstrations being carried out by DSC's science communication team at each of the screens to provide a more interactive and immersive experience.

DSC invited groups from 'hard to reach audiences' to attend the event after their interests had already been sparked through activities and interactions they experienced within their own community at free events delivered by DSC. Through DSC's community outreach programme a number of relationships had been built with groups who had never visited DSC before. The launch event provided the perfect opportunity for them to continue their journey of engagement with the Destination Space project, visiting DSC free of charge with their families.

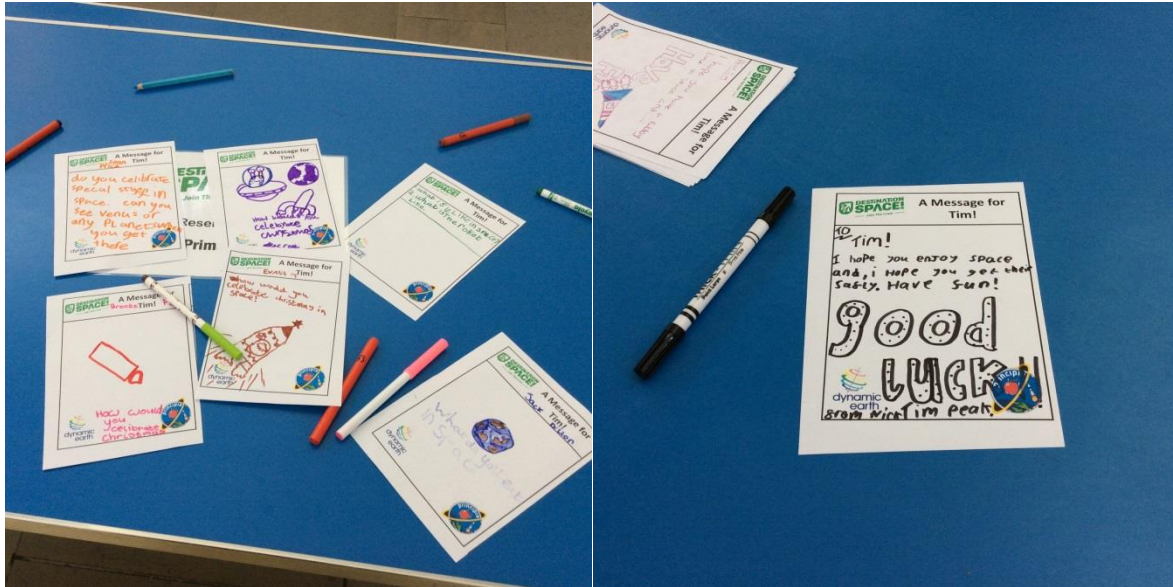
## Dynamic Earth

On December 15<sup>th</sup> Dynamic Earth hosted a memorable and very successful launch event, an event the pupils and the staff at Dynamic Earth, will undoubtedly remember for the rest of their lives.

Dynamic Earth celebrated with their Golden Ticket schools; these schools get free access to the centre for one year and come from some of the most socio/economically challenged communities in the East of Scotland.

Around 90 pupils spanning Primary 1 through to Primary 7 came to the launch; some were among the most challenging pupils in their school. Each school opted to run a competition for the pupils to select those that would visit, the competitions and the opportunity to be part of such an inspiring event obviously enthused and motivated these pupils; behaviour was exemplary throughout the day.

On arrival, schools were invited to write down messages or draw pictures which were tweeted to Tim.



*Images: 'Questions for Tim' and 'Good Luck Tim'*

The launch was introduced by one of the Learning Team from Dynamic Earth, dressed in the astronaut costume, in the ShowDome area, a 360 degree planetarium. The launch was screened live. Dynamic Earth delivered the family show afterwards and had planned to show one of their Domefilms, 'Astronaut'. Ten minutes before this event, Dynamic Earth were told Samantha Cristoforetti, ESA astronaut was visiting. Teachers and pupils (and the Learning Team) were very excited to meet a real, live astronaut! Samantha entertained the kids for 50 minutes, answering their questions with great humour and then, having run well over her allocated time at Dynamic Earth she still found opportunity to get group photos taken with many of the pupils.

A truly unique and inspirational experience!

### Eden Project

Eden Project screened the historic moment when The European Space Agency's first British Astronaut Tim Peake ventured to the International Space Station. We celebrated this endeavour through an inspirational hands-on programme of experiments and demonstrations that gave children, schools and families the chance to learn about Tim Peake's mission and space exploration.

Visitors were invited to Eden to watch on a big screen in the Mediterranean Biome, as well as get involved and be inspired by a variety of space-themed activities and information about the mission along with how astronauts live and survive in space.

## Eureka! The Children's Museum

Approximately 200 people attended the special Tim Peake launch event at Eureka! This was largely made up of local primary school children (approx.180) plus general visitors, some of whom were Home Educator families and had come specifically to watch the launch. The launch was shown on four big screens around the museum and then afterwards visitors could drop-in on some Destination Space activities. School children were encouraged to dress up as astronauts, many of who entered into the spirit and wore homemade outfits. The sense of anticipation and excitement as the countdown began was palpable, and culminated in cheering and celebration throughout the museum once the launch was successful.

Everyone made their own paper rocket and launched it with the compressed air launcher and the robot arms were a big hit too. A member of staff wore the Sokol suit all day which proved a very popular photo opportunity and the hovercraft demo was also put to good use.

Local television news, BBC Look North covered the event which was featured in the 6.30pm programme. Video footage of the launch was also shared on social media.

## Glasgow Science Centre (GSC)

Glasgow Science Centre's Rocket Launch Celebration Event was specifically targeted at school groups and children between the ages of 6 and 10. On December 15<sup>th</sup>, Glasgow Science Centre suspended normal Education Programme and invited schools to come to the centre for a space themed extravaganza of activities in celebration of Tim's launch. Over 550 pupils and teachers came to GSC to watch Tim's launch in the GSC IMAX, Science Show Theatre or Auditorium. Guests then got to experience the Destination Space Science Show or a special Planetarium show, and all of our Science Mall drop-in activities, which included contact with experts from academia and industry. All schools received a goodie bag to take home with them at the end of their day, providing them with materials and resources both to act as a memento of their day and continue their learning journey out with the centre. The feedback GSC received from our activity on this day was overwhelmingly positive.



As part of this day, GSC invited pupils to complete a feedback form about their experience of the Destination Space activities and Tim Peake's Launch. 168 pupils completed this form. When asked what three words they would use to describe their day, all respondents used the words indicated in the word cloud below, figure 1. The size of the font is proportional to the number of times this descriptor was used.





Figure 1- Words pupils used to describe their experience of the Destination Space programme and activities on Tim’s launch day.

Pupils were asked if they would like to follow Tim’s Mission after leaving the centre, to which 70% ticked ‘yes’. Pupils were also asked if they wanted to know more about Space after visiting on launch day, to which 75% of pupils responded ‘yes’. Of the 168 pupils who completed the short evaluation activity, more than 97% of respondents selected that their day was either ‘really good or ‘brilliant’ on a Likert scale.

Teachers accompanying pupils on launch day also completed a dedicated evaluation form for their Destination Space Activities. 19 teachers returned this to GSC. When asked what three words they would use to describe their day, all respondents used the words indicated in the word cloud below, figure 2. The size of the font is proportional to the number of times this descriptor was used.



Figure 2- Words teachers used to describe their experience of the Destination Space programme and activities on Tim’s launch day

All 19 respondents either ‘agreed strongly’ or ‘agreed’ with the following statements on a Likert Scale:

- I have been inspired in space and science today
- My class have been inspired in space and science today
- My class have enjoyed their visit today

- The visit has helped me deliver the 'Curriculum for Excellence'
- I am likely to follow Tim's mission with my class as a result of our visit today
- I have enjoyed my visit today

### Jodrell Bank Discovery Centre

KS3 school children were invited to come to Jodrell Bank to witness the lunch of Tim Peake to the International Space Station on Tuesday 15<sup>th</sup> December. The day coincided with the 70<sup>th</sup> anniversary of Jodrell Bank, so the children also learned about Jodrell Bank's heritage while they were here. The children watched the launch live and also saw the family science show (slightly adapted for KS3) while they were here.

### National Space Centre

After the launch was moved from November to December, National Space Centre staff were dismayed at first to find that the new launch date fell in their "closed week" – the one week of the year when the centre closes for repair and refurbishment, which is chosen for that week in December as it is also the most busy week for Christmas parties; as the centre stays closed in the day staff are able to leave the layout in the galleries for the evening in place for the whole week.

However, with some contingency planning across the different teams at the centre, the staff were able to come up with a plan to host the launch event in the Front of House area, the Planetarium, the corporate hire Shuttle Suites and the Boosters café area. On the day 434 people attended, including invited school groups (both primary and secondary) the National Space Academy Space Engineering students from Loughborough College and Salford City College, and general public who booked their free places to attend in advance.

Before and after watching the launch, visitors were able to take part in a number of activities which included:

- Making flags with the Principia mission patch and Union flag on them
- Making pom poms,
- Taking part in the door signing tradition, with information about the tradition of astronauts signing the door of their accommodation before leaving for launch.
- Skype link with RAF Fylingdales, who undertake satellite tracking and tracking and downlink from the ISS.
- Skype link with Helen Sharman, the first British astronaut
- Talk from Education team with artefacts (Helen Sharman's Soyuz launch couch & flight spare Sokol suit)
- "Smells of space" science busking
- Meteorite handling
- Apple tree planting (another astronaut tradition, carried out at the end of the event – schools attending each took home an apple sapling for their school)

## Observatory Science Centre

As the actual launch date was after The Observatory Science Centre had closed for the season, the centre ran a Pre-Launch event over the weekend of 12<sup>th</sup>-13<sup>th</sup> December. Saturdays activities included the Destination Space Family Show being performed in the morning, compressed air rocket making and Launching in the afternoon, an interactive lecture and Meet the Expert Session with Robin Mobbs from The National Space Academy in the afternoon and again in the evening as part of an open evening (which had the sky been clear would have included viewing through the historic Telescopes.) On the Sunday morning the third interactive lecture and meet the expert session with Robin Mobbs was held followed by compressed air rocket making and launching and a Destination Space Family Show in the afternoon. Unfortunately due the terrible weather conditions visitor numbers were not as good as was hoped for, despite extensive advertising ahead of the event. However the visitors that did attend did enjoy the extra activities available, and the interactive lecture and meet the expert sessions were especially good as Robin Mobbs explained things in a very vibrant and understandable way.



## Royal Observatory Greenwich

Due to the nature of their audience and deliveries, this centre did not host a launch party.

## Science Museum

The Science Museum played host to the major launch event for the UK Space Agency for England in collaboration with Discover South Kensington, Imperial College and the Natural History Museum. As part of this the following Destination Space programming ran:

- KS1 Show
- KS2 Show
- Family Show
- Photo Opportunity with cut out Tim
- Photo Opportunity with staff in replica Sokol suit

These ran between 10.00 and 22.00 on 15<sup>th</sup> December 2015.

## Techniquest

Techniquest held an evening event on 15 December to mark the launch. 325 people attended the event and enjoy an evening packed full of activities. As well as the launch of the 'Destination Space' Family Show, visitors could also see Food in Space show in our Planetarium, watch a 3D Astronomy film, take part in a Rockets Workshop, program a Mars Rover and try out some space busking activities. In addition to these, organisations such as the UK Space Agency, Institute of Physics, Cardiff Astronomical Society, Cardiff University, Airbus,

Into Film/Turnipstarfish and the Radio Society of Great Britain all had interactive stands to entice families.



Techniquest was also honoured to welcome astronaut, Pedro Duque, who added great gravitas to the evening by delivering a pre 'Destination Space' show talk and offering a Q & A session with visitors as well as graciously accepting numerous photo requests! The evening was well attended and there was a palpable buzz of excitement and anticipation waiting for Tim to enter the ISS. All visitors were very positive in their feedback with one

family stating that Techniquest had "excelled ourselves" as they left.

### Techniquest Glyndwr

Techniquest Glyndŵr held a few events to celebrate Tim Peake's Launch into Space.

#### Friday 11<sup>th</sup> December

Lesley Griffiths (AM for Wrexham) and Ian Lucas (MP for Wrexham) visited Techniquest Glyndŵr to find out about Tim's launch and the centre's involvement in the project. They were the first to write messages of support for Tim and stick them on the giant message rocket on display in the centre.

#### Saturday 12<sup>th</sup> and Sunday 13<sup>th</sup> December

All Visitors to Techniquest Glyndŵr were given the opportunity to write a message of support for Tim, attach it to a rocket\* and launch it during set times. The messages were then added to the giant message rocket. Staff assisting with launching rockets told visitors about the centre's involvement in the project and discussed how Tim would be getting into space and what he would be doing while up there. Approximately 92 visitors had the opportunity to take part in this activity.

*\*The plan was for the rockets to be water powered but the weather hampered the launch of these and air rockets were used indoors instead.*

#### Tuesday 15<sup>th</sup> December

Welsh Assembly member for North Wales, Mark Isherwood, joined 125 pupils along with their teachers from two local primary schools to witness the launch of Tim into space. Before gathering in the theatre, everyone had the opportunity to write their own message of support for Tim to add to the display of messages. After the fizz of excitement of watching Tim's launch, Tim's experience was explained in further detail with the running of the family Destination Space show.

In the evening Techniquest Glyndŵr's monthly Astronomy club held a special Tuesday night event to witness the hatch opening. 44 members of the club joined Techniquest Glyndŵr staff to find out about Tim's space journey with the Family Destination Space show. While waiting for the hatch to open, families had pizza and refreshments and then had the opportunity to

see Tim's first communication with his family. There was also Stardome shows running for members to join in with as well as a craft to make their own orbiting rocket.

### Thinktank

The Tim Peake launch event was also the day chosen to launch the Destination Space project for the whole museum. The day was advertised in advance both through social media and traditional channels such as the Thinktank Website and on marketing material. We also ran an e bulletin for teachers offering a discounted entry to the museum for each pupil, and a range of activities.

The Day started at 10:00 with the schools and members of the public arriving and being directed to the large foyer of Millennium Point which is the building Thinktank is housed in. Millennium Point have a giant projection screen and had agreed to broadcast the launch for the school groups, members of the public and also other users of the building including students and staff at Birmingham City University.



The audience started to gather around 10:30 and whilst waiting for the launch to start were entertained with space-themed busks including the hovercraft and medicine ball demo, real meteorite samples, and selfie opportunities with a staff member in the Sokol suit. We also used some of the larger busks from the public program space busking activities.



With five minutes to go the assembled audience was welcomed to the event by Lauren Deere, the museum manager, and then everyone watched the launch. In total we estimated 300 people watched the launch, including 120 school children.

The rest of the day was spent inside the museum either on gallery where we had activity and science busks taking place which included a chance to have a go on the Destination Space Join the crew game, with the option of then making their own job into a badge to keep. We also ran a series of planetarium shows looking at the night sky and highlighting the chance to see the ISS pass overhead that evening (potentially just ahead of the Soyuz rocket). We ran 3 Destination Space family shows: 2 specifically for the school groups, and one for the family

audiences visiting that day.

As an added bonus we ran a competition to win two of the Principia Mission patches, with one being won by a school child and the other a member of the public.

The whole event was run either inside the museum or just outside in Millennium Point.

We also attracted reporters for two local radio stations and gave interviews about the day and highlighting the upcoming programming taking place nationwide.

## W5

W5's launch day on 15<sup>th</sup> of December was extremely successful in terms of both content, quality numbers and simple enjoyment. Over 900 people took part, of which 451 were pupils from 11 different schools. As this was a Tuesday during the Christmas period this figure was an excellent result. The rest of the numbers were made up by members of the public ranging from university-aged young people to toddlers with parents. There were also VIP visitors including a local government minister and of course a visiting astronaut, Jean Francois Clervoy from ESA.



To help make the event the success it was W5, teamed up with the Northern Ireland Science Festival and acted as a hub for all Tim Peake launch related events happening in the greater Belfast area. The UK Space Agency was also involved with a large number of staff and working alongside them was one of the most valuable aspects of the day from W5's perspective.

So that the whole launch could be witnessed, from blast-off to docking and the first press conference from the ISS, W5 extended its usual opening times from 10am to 5pm to 10am to 8pm. Schools arrived soon after 10.00 and stayed to around 3.00. Members of the public were able to come at any time during the day. Throughout the five-storey building large screens were set up screening the whole launch live to ensure that anyone in the building was able to see the event wherever they were. However, the 200-seater lecture theatre was the hub for the 11.03am launch from Kazakhstan and it was there that most of the students, VIPs, guests and media gathered.

The actual launch turned out to be one of the most memorable days we have had in our lecture theatre at W5. Before countdown we were able to screen a short video which Tim Peake had recorded especially for Belfast. This surprised and genuinely touched everyone there. Together, the whole room counted down to blast off, and the thrill of this live spectacle was by many people there, described as emotional. Jean Francois Clervoy talked the audience through the nine-minute period to reaching micro gravity and at that point another cheer went up. Following this there was an enthralling question and answer session with Jean Francois and all pupils and guests were wholly engaged.

Following the launch screening schools and the public were able to move around the building where various workshops, talks and demonstrations were available throughout the day. Among those holding workshops were staff from Queen's University Astrophysics Research Centre, Titanic Belfast (who demonstrated water purification), GB Radio Society, Scientific Sue, NI Space Office, Vital Nutrition (who gave talks



about food and nutrition in space) and STEM Aware. There were also Raspberry Pi workshops and Into Film who did green screen workshops based on the film Gravity. The UK Space Agency were on hand all day demonstrating the Sokol suit and handing out Principia badges, stickers and leaflets.

A special word must be given to Jean Francois Clervoy who was on-hand all day and tirelessly and with good grace greeted and spoke with an endless stream of interested students, teachers and families. He gave a private audience with one lucky primary school who had unavoidably missed part of the launch and spoke with a young Brownie who's troop are taking part in the UK SPACE AGENCY Rocket Science seed planting experiment.

Later in the day people gathered again in the lecture theatre to watch the docking with the ISS and the first press conference. Though schools had long left and numbers were understandably lower, there was a crowd of around 50 who witnessed this. It was an excellent end to a long, and for everyone, a very rewarding day.

### Winchester Science Centre

The science centre ran a highly successful launch event on the 15<sup>th</sup> of December 2015 with an audience of 90 visitors and 12 members of staff. The visitors were predominately Home Educator families and one small school group. Attendees were encouraged to create special Tim Peake themed souvenir flags and took their photos with a Tim Peake life-size cut out prior to experiencing a Destination Space Family show. The BBC live feed was streamed throughout the science centre and followed by a short (20 min) talk about how space technologies affect us down on Earth from Colin Baldwin of the UK Space Agency. Younger members of the audience were interviewed after the event and they suggested that they were keen to find out more about the ISS online from home and to follow Tim's mission.



For the hatch-opening the science centre had 27 visitors who experienced the Destination Space Family show, flag creation and an informal question and answer session with Colin Baldwin followed by the BBC live feed.

ITV Meridian news supplied a camera man for the launch event who filmed the event and interviewed some of the audience. BBC Newsround requested film clips but did not broadcast them. BBC South Today did live links from the planetarium for their late night show (22:25) to combine with previously filmed footage from the day.

### World Museum (Liverpool)

We viewed celebrations of Tim Peake's launch on 15 December as an opportunity for inspiring a primary school audience (although we rolled out the activities afterwards for other visitors). The result was a wonderful event, with a real sense of community, in which the atmosphere was electric as Tim's rocket took off and 300 highly energized students joined in the countdown.



Children from 10 schools enthusiastically participated wearing space hats they had specially created in school. They watched a live link to the rocket launch and then took part in a special programme in which every child undertook two activities. These included the Mission X Train Like an Astronaut, Lego Rover robots activity, the Destination Space family show and the following:

#### **SCALE OF THE SOLAR SYSTEM (delivered by LJM U ARI)**

What would the Solar System look like if we could put it in our pocket? Using basic equipment, this interactive session will recreate the Solar System to scale, showing how the planets are spaced apart in our neighbourhood. Forget the misleading images of the Solar System with planets equally spaced out – this will show us how things really look – with all of the rocky planets condensed into a tiny space around the Sun, with the gas giants sprawling out across the rest of the Solar System.

#### **SCALE OF THE PLANETS (delivered by LJM U ARI)**

We all know that Jupiter is the biggest planet in the Solar System, but have you ever wondered just how big it is? For instance did you know that you could fit 3 Earth's inside Jupiter's Great Red Spot? In this hands-on workshop we see what it would be like if we could shrink all of the planets down and lay them in front of us, by re-creating them to scale using Play-Doh. This is a great visual tool to engage students in the vast sizes and scales involved in astronomy.

#### **USING THE SUN AS A WATCH**

A craft activity of making a sun dial and learning how to use it to tell the time without using a watch.

#### **PLANETARIUM SHOW - LIFE ON BOARD THE INTERNATIONAL SPACE STATION**

Discover what everyday life is like for astronauts on the International Space Station. This 15 minute show includes scenes of astronauts conducting experiments, exercising and their general routine.

#### **HOW TO EXPLORE THE UNIVERSE – Andrew Newsam (of LJM U ARI) Talk**

Observing the skies is at the core of everything we know about the planets, stars and galaxies that fill it, so any advance in our ability to see the universe will usually lead to fresh discoveries. In this talk we will see how modern technology is opening up a view of the Cosmos that goes far beyond the wildest dreams of astronomers only a couple of generations ago.

It was amazing and inspirational for the primary school students to have a talk by a leading university professor of astrophysics. Andy Newsam's talk was superb because of his instant ability relate to, rouse and enthuse his young audience. The Mission X activities were different, fun and had strong relevant learning messages. They were delivered by a team of 45



enthusiastic students and tutors – many good role models. Students were made up to operate a robotic rover module with an eye pad and to engage with the computer scientists.

## Annex 2: UK Science Centres Celebrating Tim Peake's return to earth

On the 18<sup>th</sup> of June Tim Peake dropped back to Earth after 6 months living and working on the International Space Station. 8,173 people around the UK attended Destination Space 'Time Peake returns' events held by our 20 delivery partners around the UK. The feedback was highly positive and people both young and old were mesmerized as they saw the Soyuz descent module touch down. Many of the delivery partners linked with the programme, reported they felt exceptionally inspired and relieved as Tim Landed, continuing their personal connection with his mission due to the level of information provided by Destination Space and the activities they had run. The following are short summaries of each centre's landing day activities.

### Aberdeen Science Centre

Aberdeen Science Centre celebrated Tim Peake's return to Earth with a live screening of the arrival and a range of activities for all the family. The activities included:

- Highlight footage of Tim Peake's time on the International Space Station
- Destination Space: Join the Crew
- Destination Space: Crew Training Workshop
- Space on the Spot (hands-on science demonstrations) in our new Space Zone
- Planetarium shows

The Destination Space Show was a "best of" from all the Destination Space shows and workshops that have been facilitated this year encouraging visitors to explore the numerous challenges astronauts have to face when they live in space. Obviously, there was a special focus on the science behind "landing".

Audience: Total 290, including 36 Rainbows and Brownies and 19 children attending a space themed birthday party

### At-Bristol Science Centre

At-Bristol celebrated Tim Peake's return from the International Space Station with a special, never to be repeated planetarium show and an exciting 'Meet the Expert – Astronaut' event.

83 people packed the planetarium to watch Tim's explore what life is like for astronauts on board the International Space Station, and how they return to Earth when they reach the end of their missions. They also got up-to-date on what Tim has been up to during his six-month trip, including the scientific experiments he has been involved in, and the beautiful photographs he has taken of planet Earth.

Visitors to At-Bristol were able to join astrophysicist Ian Montgomery-Sporle and Planetarium Officer Anna Henley for a host of spaceflight-themed activities to celebrate the finale of Tim Peake's mission to the International Space Station. Activities included holding real meteorites and discovering how they can be hazardous to astronauts, controlling a mini-robotic arm in a series of challenges, firing stomp rockets to simulate their very own launch and generally asking anything and everything about spaceflight.

At-Bristol also ran a 'Tim Peake return to Earth' competition on their website and through social media, with a chance to win some Principia goodies.

### Cambridge Science Centre

Cambridge Science Centre opened the doors early for Tim Peake's landing event so that people could get the best seats to watch Tim's final descent to Earth. Families watched the landing live on the big screen with commentary from the Centre's biggest Tim Peake enthusiast, Mandy. Following the successful landing, children had the opportunity to try some of our most popular astronaut training activities with the robot arms and hovercraft. For the remainder of the day, families could take part in a whole series of fun drop-in activities and watch the popular Safe in Space and Join the Crew family shows. Science Communicators did some busking around the Centre with a couple of rather strange looking objects (a Kevlar vest and giant weighted rubber feet) for people to experience what it feels like to return to Earth and feel it's gravity for the first time. A photo reel showcasing the best bits of the Principia Mission ran on the big screen all day. These included a variety of official mission photos, Tim Peake's own pictures and those from our delivery in the centre over the past 10 months. Alongside this, a scrapbook was available for families to look back over some of the best moments from Tim's Principia Mission and leave him their favourite memories and 'welcome home' messages. The team at Cambridge Science Centre hope it will be possible to pass this on to him as there certainly were some fond memories of his time in Space.

### International Centre for Life

The Centre for Life celebrated Tim's return from space on the 18<sup>th</sup> June by inviting visitors to watch live-streamed landing, the press conferences and repeats as events unfolded throughout the day. These were shown on two 80 inch TV screens in our 'Meet the Experts' area. This was accompanied by narration, demonstrations and activities from a Science Explainer, wearing a Sokol suit. 61 people interacted with these activities on the day. Video from the return was also captured and incorporated into the *Live Skies* planetarium presentation shown to the public on the day he returned.

### Dundee Science Centre (DSC)

On the 11<sup>th</sup> of June DSC held a special day of activities to celebrate Tim's upcoming return from space. DSC opened its doors for the 'Tim Peake: Back to Earth' event to celebrate this moment in history. DSC leveraged strong relationships with communities and groups to engage with "hard to reach audiences" and provided funded tickets for specific groups to visit free of charge removing any financial barriers. Visitors got the chance to explore the science centre, experience the Destination Space show, and take part in science busking activities including meteorite handling. Experts from Dundee Astronomical Society shared their knowledge and passion through interactive demonstrations and Cosmos planetarium attended with their dome show about the ISS.

## Dynamic Earth

Dynamic Earth is celebrating Tim's landing on the 18th June and his mission as a whole throughout the summer with a 'Space-tacular' season of activities from storytelling to green screen opportunities, special planetarium shows and specific craft and workshop activities.



These events will run through July and August to capitalise on the staggered Scottish and English holidays and the Edinburgh Festival, which brings a truly international audience to the city. Throughout this period we will also be showing film footage of Tim's successful landing and his whole mission, free to view in our public areas.

## Eden Project

Eden Project screened the historic moment when The European Space Agency's first British Astronaut Tim Peake ventured to the International Space Station. Eden celebrated this endeavour through an inspirational hands-on programme of experiments and demonstrations that gave children, schools and families the chance to learn about Tim Peake's mission and space exploration.

Visitors were invited to Eden to watch on a big screen in the Mediterranean Biome, as well as get involved and be inspired by a variety of space-themed activities and information about the mission along with how astronauts live and survive in space.

## Eureka! The Children's Museum

Following the change of date for Tim's return, Eureka! was unable to run a specific event on Saturday 18 June itself. However, on the following Saturday (25 June), visitors were able to take part in the Destination Space family show which incorporated the latest images of Tim's return. Although generally the museum was quiet, all shows were fully booked and in between performances staff engaged with lots more visitors allowing them to get up close to the Sokol suit and have a go at the hovercraft.

## Glasgow Science Centre (GSC)

On Saturday 18th June 2016, GSC retransmitted Tim Peake's landing – retransmission of the ESA broadcast on the big screen located outside GSC. This was viewed by both visitors and passers-by and tourists staying in local hotels. An estimated audience of 50 (including GSC staff, visitors and passers-by) witnessed the historical moment.

In addition, GSC ran 4 Destination Space shows in GSC's Science Show Theatre over both Saturday 18<sup>th</sup> and Sunday 19<sup>th</sup> June. GSC also delivered drop-in activities in the area adjacent to the Science Show Theatre – the opportunity to build and launch their own Soyuz-FG rockets, robotic arm challenges – as described above. GSC's Science Communicators staff wore replica Sokol suits and Astronaut Training Suits, providing opportunities for our visitors to informally ask questions.

### Jodrell Bank Discovery Centre

Jodrell Bank's 'Tim Peake return' programme consisted of a hands-on drop-in session for visitors during the May half term, combined with a special celebration event on Saturday 18<sup>th</sup> June. The latter consisted of streaming the landing live (for visitors who arrived early enough!) and running the family science show.

### National Space Centre

The National Space Centre's 'Tim Peake Landing Party' event began with an early breakfast session where 129 guests arrived from 06:30. This session included live screenings of the undocking, de-orbit burn and a catch-up commentary on the closing of the hatch which had already happened at 04:00. The centre opened to day-visitors a little earlier than normal (09:30) and screened the live landing footage in the hub of the galleries on a large screen with commentary from the Space Communications team. The audience experienced a fantastic atmosphere with union jack flags being waved and a huge round of applause when the capsule safely landed.

The day continued with Destination Space 'Astronaut Show' talks, 'Tim's Time Wheel' crafts where children were encouraged to choose their favourite moments of Tim Peake's mission and a session with Dr Kierann Shah about the Principia: Astro Academy experiments which were designed by the National Space Academy.

The National Space Centre received a lot of interest from the media surrounding Tim Peake's return with the following members of the press in attendance:

- BBC News – live footage and interviews
- BBC Leicester – radio interviews
- Capital – radio interviews
- 5 Live – radio interviews
- Leicester Mercury – online and print journalism including photography

### Observatory Science Centre

To celebrate Tim's return, The Observatory Science Centre hosted events around the original date due to the necessary inclusion of 'just in case' which did occur. This included the aforementioned family weekend activities 'Build a Space Station' with Jerry Stone over the weekend of the 28<sup>th</sup> and 29<sup>th</sup> May and the family rocket weekend over the weekend of the 2<sup>nd</sup> and 3<sup>rd</sup> July.

During the morning of Tim's actual return, after the centre had opened at 10:00am, on the 18<sup>th</sup> June, The Observatory showed live streaming of ESA/NASA TV channels following Tim's descent and landing back on Earth on a big screen television for all the Centre's visitors to watch in real time. The opportunity to observe Tim's return proved popular as people of all ages stopped to watch events unfold before them on the screen. Much tension, then relief was observed in the viewers as they saw that Tim and his colleagues were safe. As an added extra to the day's activities, Destination Space family shows were also presented on that day to give visitors more information about Tim's mission.

### Royal Observatory Greenwich

Although the 'Discover' Greenwich Girl Guides and Brownies sleepover event structure and format was decided months before the Destination Space project, ROG took advantage of the flexibility in content to theme the planetarium shows and workshops on the night around Tim, his mission and his return to Earth that day. Please see the *case study* section of the report for all the details.

### Science Museum

The Science Museum ran an event to mark the return of Tim Peake on Saturday 18<sup>th</sup> June. This consisted of us screening Tim's return on a big screen in the Space Gallery with commentary from Helen Sharman, Dallas Campbell and Helen Czerski. We then ran the Destination Space Family shows for the public.

### Techniquet

Techniquet celebrated Tim's return on 18 June with a live feed in the Science theatre followed by the Destination Space show. Space themed busking activities were also available on our exhibition floor together with a special Food in Space Planetarium show. The event was promoted on social media, via our website, and e-newsletter as well as on screens and posters within the building. Whilst the early timing of the landing meant that only a few visitors arrived in time to watch the live feed, a total 643 attended for the Tim Returns event and, of those, 346 saw the Destination Space family show.

### Techniquet Glyndwr

For Tim Peake's return event the live stream of his landing was streamed around the centre and in Techniquet Glyndŵr's theatre. Visitors had the opportunity to make a landing craft and test it in a wind tunnel. Visitors were encouraged to build a space craft from KAPLA bricks too. The press conference was also live streamed for visitors to watch.

Techniquet Glyndŵr was running its 'Superheroes' show on the day Tim Peake returned. The show was adapted for its six week run to include Tim as one of the heroes.

### Thinktank

To celebrate Tim Peake's return to Earth Thinktank ran a welcome Home Tim Event at the museum. This event was published on the morning on three local radio stations (Heart, Capital and Smooth West Midlands).

On the day Millennium Point the building Thinktank sits in used their large screen to broadcast the live footage of Tim's Return from 9:30 -14:00. This was outside the museum and free to anyone who wanted to watch. For the actual landing it is estimated around 60 -70 people were in attendance, with various other people stopping and watching whilst the footage was on.

In the museum Thinktank used the day to bring back the space related public program and to show the Destination space family show. In the museum over 300 people attended which is similar to the launch event.

Thinktank also used the day to end the Principia Badge competition which had been running the entire time Tim Peake was in space. The winners were selected at random and their prize

was posted out to them. Over 500 people entered the competition, and 5 of the Principia patches were awarded as prizes.

## W5

Building on the success of the Launch Day events back in December 2015, W5 ran a series of events on the day of Tim Peake's return to Earth. This event was significantly scaled back in comparison to the Launch Day.

From the moment W5 opened to the public on Saturday 18<sup>th</sup> June our 200 seat lecture theatre was open and showing live footage of Tim Peake's return to Earth. Timing was tight however as our building only opened at 10:00 and by 10:15 the Soyuz module containing the Tim Peake had already touched down. For the visitors that did make it up to watch the footage they were gripped. All the visitors in the theatre were people who had already been following the Principia Mission from launch.

The streamed footage ran until around 11:30 and at that point people were able to make their way to a Destination Space family show on the exhibition floors. This show was performed twice over the course of the day and both shows were well attended.

The final element of the events schedule for Tim Peake's Return Day was the inflatable planetarium. This was the first occasion on which the public were able to participate in an event in the dome. We were able to bring visitors into the six metre dome, funded by the UK Space Agency, for five screenings of Principia Fulldome movies. These short clips were narrated by a member of W5 staff who explained more detail about the International Space Station to audiences of varying demographics. These clips were very well received by the public and in most of the screenings there was a short question and answer session about the Principia mission.

## Winchester Science Centre

The Science Centre ran a highly successful launch event on the 18<sup>th</sup> of June 2016 with an audience of 220 visitors (73 directly, 147 indirect). The NASA live feed was streamed in the planetarium and was accompanied by Dr Ben Littlefield emceeing the entire event. Breakfast was put in in the Science Centre and prior to visual footage being available of the Soyuz lander guest speakers, John Chinner (Airbus Defence and Space) and Michael Gouldstone (Tim Peake's physics teacher, Chichester High School for Boys) delivered talks on both Tim Peake's mission and who he is as a person.

## World Museum (Liverpool)

824 visitors took part in events celebrating Tim's return to earth. A breadth of events was offered to cater for varying ages and levels of interest.

A team of researchers from Liverpool John Moores University, Sports Science department ran a Mission X – 'Spaced out Muscles' event. The competitive spirit came out among the different generations and led to great questions from the children and interesting discussions. The event was educational and entertaining for families who enjoyed learning about sport science and the body in space through the Mission X activities.



The event explored 'Humans in Space' and how living in space affects the human body. Its focus was the effects on muscles, tendons and bones and the exercise needed to reduce the negative effects of microgravity. The activity included an ultrasound scanning of visitors' muscles and tendons to assess the size and properties of the tissues (similar to systems used by the

astronauts at the ISS) and a vertical jump test system for assessing the strength and coordination of the muscles. Families and visitors loved seeing their muscles in 'action' and carrying out a test of their vertical jump ability. From this visitors learned about the consequences of the loss of muscle strength and function when astronauts return to Earth and the importance of physical activity for health and wellbeing in general.

Building on the obvious success of events run by the University of Liverpool's Department of Computing at the Museum, the Museum's delivery team purchased EV3 Lego robots and created a space assault challenge around which visitors steered the rover robots!



An amazing acrobatic space themed circus performance 'Beyond the Moon' was held.



Visitors enjoyed performances by a space themed pop music band, Solar Flame.

Visitors made space themed badges, had their faces painted in 'space style' and dressed up as astronauts.



## Annex 3: Highlights and Case studies form the 20 Science Centres

### Aberdeen Science Centre

Aberdeen Science Centre has a community programme which aims to engage rural and/or disadvantaged communities in STEM. As part of this a rocket building workshop was developed using the Destination Space rocket launcher and paper rocket building method. This workshop was developed for a rural community, with whom the Centre had worked with before, including bringing the public Destination Space: Join the Crew Show to them in their local community centre for a special event in April. For this reason the rocket building workshop was developed to encourage families to work together in teams to build the best paper rocket they could – the one that would fly the furthest and straightest. The workshop was in high demand so two sessions were organised.

The workshop began with an introduction to Tim Peake, his Principia mission, the International Space Station and rockets. Families were then given brief details on how to build their rocket and how they would test them along the way while working towards the best rocket they could build.

Families were given a variety of papers from which to choose from and encouraged to discuss which they thought would make a good paper rocket – Would a larger piece of paper work best? Would a heavier card work better? Or maybe even a lighter, thinner paper? Once they had chosen two types of paper a temporary nose cone was added to their rolled paper. Each family was provided with a



mandrel around which to roll their paper so that it would fit correctly on the launcher. Once they had tested their paper they then repeated the process to choose a nose cone type and fins for their rocket.

Along the way families were encouraged to discuss what works best, e.g. does it matter if the nose cone is secure and sealed? Do the fins help the rocket fly straight? By working out how to get their rockets to fly straight teams were able to fly further via a door in the hall out into the next room!

The age range of children that attended the workshop ran from 5 to 14 years old and parents, grandparents, childminders and older siblings all helped in their family teams. In a total Aberdeen Science Centre interacted with 43 participants from this rural village.

All participants thoroughly enjoyed the workshop with one participant noting: “Just to say a huge big thank you for the rocket building workshop in Tarland yesterday. It was great! Sadly though we are now a bit addicted and are trying to build our own launch pad, what could possibly go wrong?”

## At-Bristol Science Centre

There was a massive buzz around Tim Peake's return to Earth and the associated Destination Space activities in At-Bristol and the At-Bristol team successfully capitalised on this by ensuring a significant amount of media coverage. Taking part in television and radio interviews with BBC Points West and BBC Radio Bristol as well as being interviewed by the local press the Bristol Post, enabled the team to enthuse about the project while developing their skills in relation to talking to the media.

## Cambridge Science Centre

Between February and July, 1843 people have attended special events at Cambridge Science Centre.

Cambridge Science Centre has adapted the activities from the KS1 workshop into an astronaut themed birthday party (Destination Space Mission: Party). The activities are ideal for a party as they are simple, highly interactive and most importantly fun. So far 125 children have attended 7 astronaut parties.



In Celebration of Tim Peake's birthday, Cambridge Science Centre ran a series of craft activities running alongside the Destination Space shows. Children and families could decorate 'eggcellent' rockets and make birthday cards for Tim.

## International Centre for Life

### Unleashing potential in the Destination Space Schools Workshops

The Centre for Life recognises the huge potential that Destination Space workshops have to engage and inspire young people with manned space flight and wider STEM subjects.

The Education Team at the Centre for Life have used the materials and protocols provided for the Destination Space Workshops as a springboard to create new workshops tailored to fit in with our approach to hands-on science learning, workshops that would not have been created otherwise. Life's Education team took the elements that suited Life's way of working and extended them to allow a more investigatory approach.

Significant changes were made to the KS1 offering to turn the 30 minute show into a 1 hour hands-on workshop. Life's staff took the opportunity to teach Materials, a core KS1 science topic, in an exciting context. The task of choosing the best material for a spacesuit was

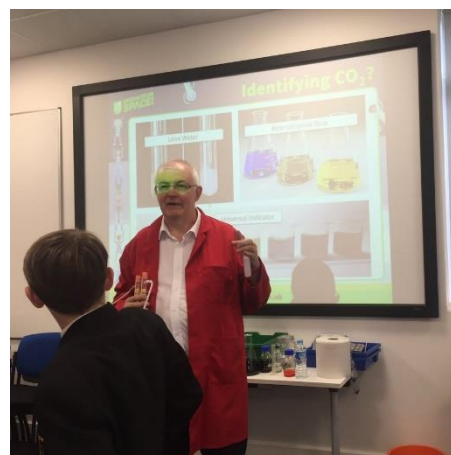
transformed into a hands-on investigation that all students in the class took part in by performing quantitative tests of strength, flexibility and weight. This allowed opportunity to open up the discussion to materials that were initially developed for space exploration, but are now used in everyday life. Another popular addition is Tim's Space Teddy demonstrating how astronauts use Velcro to attach their sleeping bags to the wall at bed time. Students enjoy singing a wake up song to him at the end of the workshop.



Destination Space KS2 workshop has now replaced Life's popular 'Astronaut Training' workshop, as Life's most frequently booked and highly praised workshop. Destination Space has provided an unexpected opportunity to breathe new life into it by combining the strongest elements of each workshop. There are fewer staff-led demonstrations in Life's version to allow more time for hands-on activities that the students carry out themselves. The core activities of testing maximum absorbency garments and using robotic arms are included but with modified protocols. The Education team at Life have added an activity to show the challenges of working in a space suit, which links nicely to showing the Sokol suit. The team at the Centre for Life tend to run activities as a whole group in workshops where possible as not to split the class to work on different tasks. The extra funding has allowed Life the opportunity to purchase more robot arms, allowing the whole class to work together.

For the KS3 workshop the team at Life extended the CO<sub>2</sub> emergency scenario, allowing students to investigate which reagent was the best indicator of CO<sub>2</sub> from a selection, before using it to test the CO<sub>2</sub> absorbency of a range of materials. This focussed on the underlying chemistry and showcased a real world application. Using traditional glass absorption tubes has helped give a more professional laboratory feel which encourages a mature approach from the students.

The Education team feel that prioritising a hands-on, student centred approach to investigations, throughout the workshops has enabled a more rewarding learning experience.



### Dundee Science Centre

Dundee Science Centre launched its Destination Space activities for Secondary Schools in May 2016, including both a new Third Level workshop (12-15 years old) and a new Secondary School demo show.

The new workshop is adapted from the 11-14 workshop and tailored for S1-3 pupils in the Third Level of the Scottish 'Curriculum for Excellence'. After an introduction featuring a lot of background science and our favourite Destination Space demonstrations, pupils work in small groups on three activities: Circuit-Scribe electronics, paper rocket engineering and robot arm piloting. Three schools attended the workshop in the first week, including one group of pupils

with learning difficulties and one group who had selected to visit the science centre as an option during their 'activities week'.

Kemnay Academy brought the whole of their first year to DSC for Destination Space activities, as their Science Department's first ever trip for a whole year group. All 140 S1 pupils visited across two days, and participated in an interactive demo show that we adapted from content from the 11-14 workshop, family show and 7-11 workshop.

Feedback was very positive from both teachers.

### Dynamic Earth

With Dynamic Earth's focus on Earth, Environmental and Planetary Science, the centre works with over 80,000 school pupils each year aspire those who come along to science and to science careers. And with an under-representation of women particularly in the chemical, physical and engineering fields, each year Dynamic Earth hosts a careers day with a bit of a difference. The centre collaborates with some amazing scientists out there for this one day event. The scientists are generally female and are more than happy to talk about their career objectives and aspirations to the secondary school pupils who come along. This year, the annual careers event aimed was themed around Earth Observation, showcasing many women in exciting roles.

This subtle approach to promoting women in science while not excluding boys took place in March 2016 with additional funding from the Royal Society for Chemistry meaning transport costs could be covered for those who needed it.

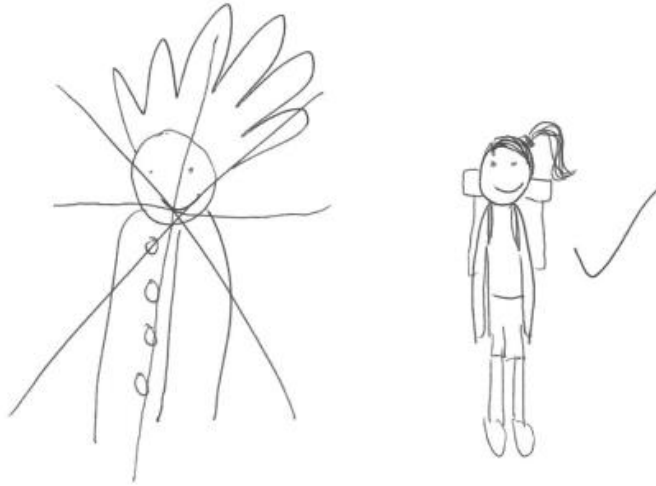
Over 120 mid to late secondary school pupils and their teachers as well as one community organisation had the rather unique opportunity to chat to scientists from a range of backgrounds and organisations, including Greenland explorers; the Glaciology and Cryosphere Research Group from the University of Edinburgh who showcased their work using satellites to understand ice sheet and glacier stability, GIS industry experts and deep sea coral specialist who use GIS systems and satellite imagery to map coral growth and depreciation. GIS workshops were available for pupils and teachers and there was a screening of We are Astronomers for all.

British Geological Survey scientists were on hand as were the Institutes of Physics and Chemistry to discuss relevant career trajectories.

Most importantly, feedback tells us that perceptions were changed, words like 'inspirational', 'awesome', 'excellent' and 'fun' were frequently used. Many pupils expressed a change in perception from a scientist in a white coat to something more associable, exciting and inspirational. This picture sums it up nicely, when asked to 'Draw a Scientist':

Use this space draw a scientist!

Have your perceptions changed?



## Eden Project

Eden Project has never shied away from boldly going where no one has gone before; planting a rainforest in the middle of a clay pit in Cornwall is testament to this. And now space is on the agenda at Eden thanks to The UK Space Agency and ASDC for the Destination Space programme.

Eden is about connecting people and the living world; we engage our visitors through inspiring exhibits, humour, stimulating conversation and stories with positive messages to create unforgettable learning experiences. We will use this new and exciting space programme 'Destination Space' to convey vital environmental messages. Our core mission is to convey the fragility of earth as a resource to protect and to celebrate the triumph of human innovation as a means to sustaining it.



Nowhere else are these issues as beautifully illustrated as through space travel and there has been no better time in British history to do this than in conjunction with Tim Peake's mission to the International Space Station.

### **Destination Space at Eden Key Messages**

- Protecting and understanding our world and our long-term survival – Space exploration revives our appreciation of the finite state of our Earth's resources and natural environment and it helps us to see an overview of the planet and to understand the exceptionally complex and fragile world that we live on. This is rooted in Eden's narrative.
- Inspiration –The excitement of space gives an excellent context for STEM education. The Apollo missions inspired an entire generation of students to pursue STEM careers and it will again with Tim Peake's mission into space.
- Space exploration will allow us to find the answers to the big questions – How did life begin? How did the universe begin? Are we alone?
- Exploration – "It's human nature to stretch, to go, to see, to understand. Exploration is not a choice, really; it's an imperative." Michael Collins, flew on Gemini 10 and Apollo 11. To be human is to be an explorer. Space is the final frontier, and it calls to the explorer in all of us!
- New Technology – Space exploration brings together a lot of great people from many different fields and puts them to work on some very difficult problems. The result is not only fantastic scientific discoveries, but also many useful inventions.

### **Eureka! The National Children's Museum**

#### ***Trying new things***

Although well accustomed to delivering workshops and shows to a variety of audiences, Eureka! has shied away from trying anything too technical or which has the potential to set the building on fire! Mainly because we're usually working within a tight budget, but also because neither our building nor our staff were fully equipped to use flammable gasses or chemicals in our shows.

So when we saw the oxygen/hydrogen and whoosh bottle demos at the training academy our immediate thought was "there's no way we'll be allowed to do those!" And to a certain extent we were right. Unfortunately we don't have anywhere on site where we could safely store the oxygen and hydrogen, so those demos were ruled out quite quickly. But we really wanted to have a 'wow' factor in these shows and so were determined to include the whoosh bottle demo, and set about getting the thumbs up from our health and safety people.

Up until now the most explosive demos we've ever done at Eureka! have been Alka-Seltzer rockets and Mentos geysers – both of which have had their share of mishaps - think vinegar-stained ceiling tiles and cola-covered Enablers! So we had to prove that a) the demo was perfectly safe if carried out correctly and that b) our staff would be confident to do so.

After purchasing all the necessary equipment and seeking advice from the Destination Space development team (Kierann and Sophie at NSC were particularly helpful), we did the whoosh bottle demo for our Facilities Manager so he could see it in action and advise on what additional control measures we would need to put in place. Although there was an air of trepidation, the demo went well and we realised that although it has the wow factor and looks quite dangerous, if all procedures are followed correctly it is safe and our Facilities Manager was happy for us to include the demo in our shows.

Following advice from NSC we spent quite a bit of time ensuring that all of the delivery team were fully aware of all the control measures and safety procedures and gave them plenty of opportunity to practice the demo before doing so with a live audience. At the start of the programme I witnessed a few shaky hands and heard some nervous explanations, but the team are now very confident and it's their favourite part of the family show.

Without being involved in the Destination Space programme it's likely that Eureka! would never have attempted such a risky demo and we'd still be churning out good old Alka-Seltzer rockets! The guidance provided by this project has given us the confidence to try new things and we have now also adopted the Destination Space risk assessment format across the organisation as we have found it to be much more effective, thorough and user-friendly than our previous form.

### Glasgow Science Centre

As a legacy of delivering the Destination Space programme we secured additional funding from ASDC for three new exhibits located in the Space Zone that leads to the entry of the newly refurbished Planetarium. Opened in August 2015 to coincide with the opening of the newly refurbished full-dome Planetarium, the Space Zone included a giant planet wall, a constellations wall, 3 movable exhibits and an information screen. The left hand wall however was a bit bare.

Since end of June 2016 we have installed the following exhibits:

- 'Dressed for Space' – the x-ray of the space suit that Alan B. Shepard wore on the Moon during the Apollo 14 mission in 1971. This is displayed in a light box and includes further information on 'liquid cooler', weight, materials, boots and the accordion like folds that help the astronauts to bend their joint when the spacesuit is pressured.
- 'A view of Scotland from the Cupola – the largest window in space', with reference to Tim Peake: "Tim Peake is one of the 200 astronauts who have occupied the International Space Station since 2000" and a quote by Tim Peake: "Being in space you realise what matters most on Earth: look after each other and the planet".
- 'Spacesuit gloves' which enable visitors to build using lego bricks with astronaut gloves.

Observations at the exhibits show that many visitors head directly to these exhibits, in particular the spacesuit gloves. On average dwell time at the three exhibits is 4 minutes 32 seconds. We witnessed many examples of intergenerational interactions with grandparents

showing their grandchildren 'how to' play with the lego once they have tried the spacesuit gloves on. We overheard a young boy referring to Tim Peake, that "*we've learned about at school*".

### Jodrell Bank Discovery Centre

One of the most positive parts of this project for the Jodrell Bank Discovery Centre has been the delivery of the family science show. During school holidays, our science shows are the main activity for family audiences, with an average of 80% of daily visitors seeing a show, and around 600 or 700 audience members a day during half terms.

The science show equipment provided by the project allowed our team to deliver a science show that was different from anything that had been delivered previously. Since its relaunch in 2011 the Jodrell Bank Discovery Centre has never delivered a science show which focused solely on human spaceflight. The topic proved to be very popular with audience members, due to the human interest and the relatability of Tim Peake. The high quality of the equipment provided (e.g. the hovercraft and air powered rocket launcher) allowed for 'large' demonstrations which delivered the wow-factor for visitors. The special items (e.g. astronaut food and ATV solar cell) provided further credibility to the show, which inspired audience members even more.

Feedback from the delivery staff themselves was very positive, with presenters firmly enjoying delivering the show. There was a sense of the bar having been raised; staff felt energised and looking forward to developing even bigger and better shows in the future.

Audience feedback was also overwhelmingly positive with 92% of interviewed children reporting that they were now more likely to study science, after seeing the show.





## National Space Centre

The National Space Centre was asked by Sky News to work with them on a live link to Tim Peake on the ISS on the 29<sup>th</sup> of March. Three students from the National Space Academy's Space Engineering course attended the Sky News studio to ask questions directly to Tim, and the link up was screened live at the National Space Centre. The team at Sky News wanted to have questions from young people but at a more advanced level than the questions from primary students, to elicit more in depth responses from Tim himself. The link up went extremely well, as did the event at the National Space Centre, with both school groups and the public watching, and student Emily Bradley who asked a question directly to Tim saying it was the "best thing I have ever done".

## Observatory Science Centre

On the 18<sup>th</sup> April 2016, The Observatory Science Centre teamed up with St Richard's Catholic College, Bexhill to take part in an outreach event which included a live link up with the ISS and a question and answer session with Tim Peake. In addition to the students of St Richard's, the college invited teachers from 15 local primary schools to bring a maximum of 4 students to the event. The day was also attended by local dignitaries, television and radio stations.

Two members of staff from The Observatory Science Centre hosted a KS2 drop-in activity with the invited primary schools and led a KS3 workshop for students at St Richard's college.

For the KS2 drop-in activity, 8 robotic arms were laid out for the invited primary students to operate in order to move foam shapes from one area to another. One member of our staff assisted the pupils in using the robotic arms and explained how they related to the Canadarm 2 and that Tim Peake was trained to operate it. During this time, the other staff member dressed up in the Destination Space replica Sokol spacesuit and walked amongst the pupils, explaining how the suit can protect astronauts during take-off and landing in a Soyuz FG rocket. This member of staff also used syringes and mini marshmallows to demonstrate how a decrease in pressure causes the marshmallow expand. Both of these activities were very popular and attracted large numbers of pupils. There were numerous requests from teachers for permission to take photographs of their students with The Observatory Science Centre's 'astronaut'.

Following the drop-in activities, the KS3 workshop was delivered to 180 students from the college. The students were split into 3 groups and each workshop lasted 30 minutes. The groups were then subdivided into 3 sets of 20 students who participated in 3 different activities that lasted for 10 minutes. One set were instructed to use the robotic arms to move foam shapes to different destinations on the ISS template. This activity was supervised by a school teacher. Another set were led by a Science Centre member of staff to 'draw' series and parallel electrical circuits using the Destination Space Circuit Scribe kit. As this activity was only 10 minutes long, 3 partially drawn circuits were given to the students who completed the circuits using the special pens with conductive silver ink and attached the magnetic components in the correct order to test circuits on the ISS template. The last set of students sat round a table where a Science Centre member of staff, who was dressed in the replica Sokol suit, explained how the design of the suit could protect astronauts if something went wrong during take-off and landing. The students were given syringes and mini marshmallow and instructed on how to change the air pressure inside the syringe and observe how this affected the size of the marshmallows inside.

Finally, everyone came together in the main school hall to listen to Tim Peake answer a selection questions read out by the students of St Richard's College. Just prior to the live link up, there were several talks on Tim's Principia mission (including a talk from 2 members of the UK Space Agency). The audience was also treated a talk by an amateur radio group who gave an introduction to the technology and equipment used to communicate live with Tim in the ISS. The event was streamed live over the internet and appeared later that day on BBC South East Today news. A Science Centre member of staff was clearly visible in the audience as she was the only person dressed in a bright white Sokol spacesuit!

### Royal Observatory Greenwich

Although outside the original scope of our agreement for Destination Space, we could not miss an opportunity on the 18<sup>th</sup> of June which happened to be timed with Tim's return to Earth. Royal Museums Greenwich hosted approximately 360 girl guides, brownies and their leaders for planetarium shows at the Royal Observatory Greenwich and a sleepover with interactive quizzes hosted by astronomers from the Royal Observatory Science Learning team in the National Maritime Museum. For the planetarium shows we used the show insert format to illustrate how to locate the International Space Station and to describe Tim's mission to the ISS, his fiery descent through Earth's atmosphere, and eventual safe landing on the planet's surface.

For the interactive quiz for groups later in the evening we used a Destination Space themed version called *Destination Space*. This included images of the Soyuz parachute deployment and Tim's first phone call from the ground since his departure six months previously. Each participant used quiz keypads to introduce the interactivity and competitive atmosphere of a quiz show. The groups were clearly inspired and the four quiz sessions and planetarium shows were attended by 80-90 guides, brownies and their leaders so the atmosphere was electric with enthusiasm and excitement for Tim and the future of crewed space travel. The following quotes from the co-organisers of the events comment on the day in general, but the shows and quizzes represented the majority of interactive activities that took place on the evening.

### Science Museum

At the Science Museum the Families and Accessible Programmes team delivered the Destination Space Show over the period of approximately six months from December 2015 until Tim Peake's return in the middle of June. The original KS2 show was reworked to a 30 minute show aimed at families with children aged five and over. The show was performed multiple times a day during school holiday periods; the museum is very busy during these times and we knew that there would be the uptake for it and sure enough our show space was consistently full. This family show was also performed every weekend, either once or twice a day during the period Tim Peake was in space.

Developing and delivering the show was a new and interesting challenge for the team. It was exciting to work with different centres and good to develop something collaboratively with the involvement of prestigious organisations such as the UK Space Agency and ESA. This also meant however that we had to adapt content in a new way; although we are used to working to specific guidelines and sponsorship rules, it was an extra challenge to balance the visions of multiple different organisations, whilst also thinking of the needs of our audience and maintaining our extremely high standard. Some of the props were very difficult to source and with the amount of organisations involved, others sold out quickly. If a large project like this were to occur again in the future it would definitely be useful to have accessible suppliers. It

was also new for us to have a variety of different teams within the museum performing different versions of the same show, it was interesting to see how they chose to adapt the content and it was good to share expertise and best practise.

The reaction from the public was overwhelmingly positive; children were consistently engaged with the show and would stay behind to ask follow-up questions at the end. Questions such as “how old do you have to be to be an astronaut?” were frequently heard, both children and parents would express how impressed they were with some of the experiments. The variety of the experiments chosen worked well and each individual experiment was strong. We could tell by looking at our feedback; when we asked visitors to choose a favourite, almost every answer was different! Overall the show worked well and we definitely enjoyed performing it.

### Techniquest

On Friday 15 January 2016, another piece of history was made when Tim Peake conducted not only his first spacewalk, but also the first spacewalk for an official British astronaut.

To mark this momentous occasion, pupils from local school Mount Stuart Primary were invited to visit Techniquest to take part in hands-on space activities. One of Techniquest’s presenters welcomed the pupils and spoke to them about Tim’s spacewalk, and answered any questions they had.



Next, the pupils worked together in groups on a task that required them to design the ideal space station. While doing so, they enjoyed the spectacular backdrop of the live video feed from the ISS, including many shots being shown live from Tim Peake’s helmet camera.

Once the activity was completed, pupils assessed their space station designs, and were able to ask more questions about the spacewalk. Having the live video feed playing really enthused and inspired the pupils, with many expressing disbelief and awe at the ability to see the event in real-time.

Also in attendance were ITV Wales, who filmed shots of the workshop and interviewed pupils for that evening’s news broadcast.

### Techniquest Glyndwr

Techniquest Glyndwr linked up with Catalyst science centre to deliver activities at the ‘Big Bang North West’ fair in July 2016. Between the two organisations over 500 secondary school students were engaged with. The vast majority the students attending were from school STEM clubs, so had a high interest in STEM. They enjoyed the Destination Space activities on offer and asked many high level questions.

Had the two Science Centres not linked up attending the event would have been too costly for Techniquest Glyndwr to attend. Working together has also opened up the opportunity to deliver the Destination Space family show in a new location. Currently the show has been presented almost solely in Techniquest Glyndwr theatre space. During the school summer holidays the two centres are engaging in a show swap. This utilises resources and allows both

centres to have new activities on their public programme without the additional cost associated with developing new activities.

### Thinktank

The key stage 1 destination space show has been a real bonus to the education offer at Thinktank. To have a show that covers a variety of topics in such a fun and current way has made it valuable learning offer. For any teacher looking to cover the topics of space, material properties and choices as well as the topic of explorers this show has met their needs.

Thinktank already had a material show for KS1 that was ok but not brilliant and needed a lot of work to get it up to the same standard as the other shows and workshops we offer at the museum. The Destination Space Show covered a lot of the same topics and allowed us to invite teachers to swap to this new show that also had a story about space and talked about Tim Peake.

The show works well in multiple locations around the museum and also on outreach and with the numerous volunteering opportunities is great to watch, take part in and also to present. We have modified the show slightly by adding a large fan from the mobile planetarium and a larger ball instead of the hair dryer and small ball. This allows the demo to be seen easier by the audience and more reliable from a presenter's perspective but also manageable for the children to catch the ball in the net.

We have also removed the water bottle section of the show. The main reason was the demo was very unreliable and even when working not very impressive brown water coming out slightly clearer. We also felt that although bodily functions are interesting to all audiences to do a separate demonstration for both wee and poo was a little bit overkill. The poo demonstration with the vacuum was by far the better demo so we kept that one and allow a few people to have a go with the vacuum and just removed the slide for the water filtration unit.

With the new start and end footage by Tim Peake added to the PowerPoint the show is now ready to be run for the foreseeable future.

### W5

We felt that our launch day event was the most successful aspect of our involvement in Destination Space so far and set a model for the type of event we would like to hold again in future. It was a success built on collaboration with a wide range of key players – W5, UK Space Agency, ESA, and the Northern Ireland Science Festival and the NI Space Office. There was also valued input from Queen's University and other smaller scale contributors.

The Tim Peake launch had been much anticipated in the media and interest was huge. A lot of centres and organisations wanted to be involved in some way. However, as Northern Ireland is a relatively small place it was felt that a range of activities being held around the province would dilute the impact of the occasion. Thus, by teaming up with others, W5, being a large and central building in Belfast and well-known as a STEM and education provider, was able to act as a focus point for the day. W5 was able to host and contribute to the event and the overwhelming sense was that a wave of enthusiasm and positivity for all-things-space had been created with a momentum that is only continuing and growing.

## Winchester Science Centre

A major event was organised and delivered at Winchester Science Centre to celebrate the successful return to Earth of Tim Peake. Visitors were invited to the Centre from 06:15 to join the Deputy Head of Education in watching the live NASA stream of decoupling and Tim's return to Earth. The event had several special guests and was emceed by Dr Ben Littlefield supported by Vanessa Holt.

To celebrate the culmination of Major Tim Peake's mission in space Winchester Science Centre put on a very special event to welcome him home. From 06:15 in the morning of the 18<sup>th</sup> of June the live NASA stream of footage was broadcast in the planetarium for a special pre-booked audience of 73 members of the public to view. Complimentary commentary was delivered by Dr Ben Littlefield, explaining what was going on and discussing aspects of Tim Peake's mission. When the Soyuz module had left visible range from the International Space Centre, Michael Gouldstone (Tim Peake's physics teacher from Chichester High School for Boys) gave a rare insight into the boy behind the man and what he was like before joining the Army Air Core.

Visitors then broke up for breakfast before reconvening in the planetarium to take part in a workshop ran by John Chinner (Airbus Defence and Space) all about Tim Peake's mission with lots of audience interaction and some activities for younger visitors to take part in.

When visual contact was re-established Dr Ben Littlefield continued emceeing the event taking questions on the construction of the landing module and discussing aspects of life up on the International Space Station. A huge cheer went up in the Centre when Tim was first brought out into the sun and after a final sum up the event moved to a specially prepared show space where the live feed was projected throughout the day.

Impact and lessons learnt:

- Highly successful event for a relatively small number of people (73 directly, 147 indirectly), further marketing would have been ideal but challenging due to the unpredictable nature of space travel
- Emceeing such a live feed was exciting and made it more personal for the audience, it gave the audience the chance to ask questions that the NASA live feed brought up
- The addition of Michael Gouldstone as a guest speaker was very successful and helped people connect to Tim Peake as a person rather than a personality
- In future events the addition of a photographer and individual responsible for social media would have been beneficial
- Consideration of a legacy, for example take home information, literature or other material would have been useful

## World Museum Liverpool

Everyone in the Education team has enjoyed delivering the Key Stage 1 school show which has been a positive experience at many levels. It is very accessible because of its simplicity and because children enjoy the imaginary play and carrying out the actions: it has an obvious point and flows easily towards the ultimate goal. The range and variety of props (especially the parachute) give it a wide appeal. Children enjoy it, it is very inclusive for SEN children and children using wheelchairs can fully join in. Two of the delivery staff in the team lacked confidence working with this younger audience yet now absolutely love delivering the workshop which makes it all the more fun for the children.



## Annex 4: Legacy

### Aberdeen Science Centre

Destination Space is not fixed term programme. Its legacy is solid and manifold.

The staffs were trained and are now more knowledgeable about space science and public engagement with the space sector. New activities will therefore be easily developed.

The equipment received will be reused in updated Destination Space shows and workshops thus ensuring that people living in or visiting North-East Scotland and beyond will have the opportunity to discover the wonders of space exploration.

Finally, the Space Zone will be a permanent resource in the Centre. Celebrating the Principia mission and highlighting great opportunities for young people, it is a valuable asset for public engagement.

### At-Bristol

The workshops for schools have generated a lot of interest and enquiries from teachers and booking numbers are high. The workshops will become part of At-Bristol's permanent programme for schools going forward and will be available to schools on an ongoing basis.

Through taking part in the Destination Space programme our Live Science Team have been enthused and inspired to present content and concepts linked to the project and many have commented that their knowledge has increased in this area. This staff development will feed into other areas of At-Bristol's programme.

The family show will become part of At-Bristol's library of fun, interactive shows that we are able to deliver on a rolling basis.

Fantastic content from the planetarium show including views of the International Space Station and Tim Peake news updates will be valuable in other areas of At-Bristol's diverse programme of public and school events and activities.

### Cambridge Science Centre

The shows and workshop have been delivered in the centre alongside the Cosmic exhibition, and will go out to schools as part of the COSMOS Roadshow (the comprehensive outreach programme) from September 2016. Pupil number reached is around 600 per week and also includes a one week town centre exhibition for members of the public. The Roadshow programme actively targets pupils and families in communities with low science capital in East Anglia (such as Peterborough and Bury St. Edmunds) and will engage a wide variety of people with Destination Space.

### Centre for Life

After the Destination Space programme has finished, a number of aspects of this project will continue at the Centre for Life.

- The ISS scale model will remain outside the planetarium entrance for all to see.
- Aspects of the schools workshops developed for the project will continue to be used.
- Demonstration materials from the show and the Sokol suit will continue to be used for demonstration and science busking purposes.

- The awareness and knowledge of human spaceflight among staff has been significantly raised by the project.
- The Centre for Life is actively pursuing getting Tim Peake to visit the centre.

### Dundee Science Centre

The three Destination Space schools workshops (First, Second and Third Level) will continue to be included in our 3-18 Learning Programme for the foreseeable future. Other practical benefit, such as the use of Destination Space equipment, demonstrations and ideas, will also continue to be felt in many other workshops too (including Materials Science and Astronomy). Our staff – including part-time Science Communicators, full time Officers and managers – have also benefited from increased knowledge and confidence communicating about human space exploration.

### Dynamic Earth

The storytelling and primary school workshops (KS1/2) are to be featured in the Education brochure throughout the 2016/2017 academic year for schools to take part in.

### Eureka! The National Children's Museum

Following the success of the Destination Space programme Eureka! plans to adapt the school's workshops and make them available across the Spring term 2017. The equipment and resources we have received will undoubtedly be utilised in any future space related activities at the museum, especially the Sokol suit, compressed air rocket launcher and hovercraft, and the additional equipment we have been able to purchase through the capital funding will ensure that future space activity at Eureka! will use up-to-date technology and continue to inspire children to be interested in STEM subjects and space exploration.

### Glasgow Science Centre

As a legacy of the 'Destination Space' programme, we secured funding from ASDC for three new exhibits that were installed in our newly refurbished space zone, adjacent to GSC's full-dome Planetarium. These are:

- 'Dressed for Space'
- 'A view of Scotland from the Cupola – the largest window in space'; and
- 'Spacesuit gloves'.

Further information on the three new exhibits is available in the Case Study section.

We also inherited and adapted a new show for GSC's Science Show Theatre that will add to the 'portfolio' of shows that we can re-use.

### Jodrell Bank Discovery Centre

All of the schools workshops will continue to be part of the Jodrell Bank Discovery Centre education programme. The family science show and hands-on activities are now part of the Discovery Centre's suite of engagement activities for families and will continue as part of our programme over the coming years.

The family science show is being performed on 23<sup>rd</sup> and 24<sup>th</sup> July as part of the bluedot science and music festival, at the Jodrell Bank Discovery Centre. There are currently expected to be



around 8,000 and 6,000 people attending this festival on the Saturday and Sunday, respectively.

### National Space Centre

The National Space Centre has seen a number of changes within the galleries during the Destination Space programme, including the installation of a 'Tim Peake Wall' made possible by a grant from the UK Space Agency and ASDC. This exhibit will stay in situ for the foreseeable future and has been designed with the ability to include further artefacts, should anything become available for loan upon Tim Peake's return. The 'Blast Off Experience' in our 'Into Space' gallery has also been altered to show footage from Tim Peake's launch on 15 December 2015.

An application has been submitted for a visit from Tim Peake. The National Space Centre's visitors have demonstrated a continued interest in Tim's mission throughout and many have expressed an interest in meeting the British astronaut upon his return so a visit to the centre would certainly continue the excitement surrounding the mission.

### Observatory Science Centre

During the school summer holidays The Observatory Science Centre will be putting on up to three Destination Space Family Shows a day, that will include the new updated post return footage of Tim Peake and some new elements designed around explaining the physics of re-entry into the Earth's atmosphere and descent back to Earth. The Shows will be fun and educational with as much audience participation as possible. The Destination Space Show will continue to be offered at The Observatory as an option for visitors for years to come.

As mentioned previously, The Observatory Science Centre will also be holding further Space-related workshops for children such as 'Be an Astronaut' plus an adult workshop, '3D printing for beginners', inspired by the use of 3D printing on board the International Space Station. A replica of the ratchet printed on the ISS has already been printed for use in the Destination Space shows. In the future The Observatory intends to continue using, devising new workshops to offer schools and the public making good use of the Destination Space kit and resources. The popularity of the schools workshops has meant that these will be embedded in the schools programme for the foreseeable future and planetarium shows will also continue to talk about space flight and the legacy that Tim Peake has left.

The Observatory also anticipates that Tim Peake's Mission will be a 'hot topic' for many months even years to come so will continue to endeavour to support that through further events, activities, displays and discussions.

The lasting legacy of the Destination Space programme is very important to the staff of The Observatory Science Centre and they have been and continue to be very proud to be part of it, therefore will strive to support the project in the future through any means appropriate.

### Royal Observatory Greenwich

There is no doubt that people will be talking about Tim Peake and the Principia Mission for a very long time to come. In terms of the schools programme, as with all ASDC funded projects we have worked on in the past the equipment we received was so fantastic that we now plan to incorporate it wherever possible into other aspects of our formal learning programme. This means that although all of the Destination Space activities will remain complete so they can be

used again, the equipment will also be repurposed for many other workshops and science theatre shows that we would not have been able to develop otherwise.

From a family learning perspective the props and equipment provided by ASDC and the UK Space Agency have particularly engaged younger visitors in the realities of crewed missions to low Earth orbit. The basic needs of clothing, food, water and mental well-being alongside the physics of spaceflight and orbits have all been explained through a combination of the equipment and the academic backgrounds of the Observatory Explainers. We hope to continue this awareness of the UK's stake in future space missions across the rest of our Spaceship Season and utilise formats and equipment for other informal learning programs in the future. The Destination Space project has captured the imagination of our visitors, and better yet our staff have been able to express the possibilities for young visitor's future engagement with the space science industry - whether that's following directly in Tim's footsteps or becoming involved in the space science sector in general.

### Science Museum

The Destination Space family show is being tweaked to reflect Tim Peake being back on earth. The aim is to have this as a show that the Science Museum can use in the future.

The Science Museum is currently scoping out how to make the KS2 Show in to an Outreach version.

### Techniquest

Techniquest took up an opportunity in January to submit a bid to the UK Space Agency for a project that would celebrate Tim Peake's Principia Mission. We were delighted to be told in February that the bid was successful.

As a result Techniquest unveiled a brand new Robot Arm exhibit on our exhibition floor on 31 March. The exhibit is accompanied by an AV display with a continuous live feed from the ISS and has become a firm favourite with staff and visitors alike. (Pictured right).



### New programmes

Techniquest's participation in Destination Space has meant that the Destination Space KS2 Workshop and the Destination Space family show have become a part our rolling schools and public theatre programme.

### Developing new relationships

In addition, Destination Space afforded us the opportunity to enhance our stakeholder liaison. Techniquest already had excellent relationship with Department of Physics Cardiff University, and Space made Simple. However the Launch Event was an excellent mechanism for mobilising other organisations to get involved and work with Techniquest- companies / organisations like Airbus, Institute of Physics, Radio Society, Into Film, Snowdonia Aerospace LLP, QinetiQ and Environment Services.

## Techniquet Glyndwr

The legacy of this project is to imbue the family destination space in the public programme in future years. The three activities provided for schools will be included in the core programme of Techniquet Glyndwr too as 'Space' is a topic that is often asked for but previous to this project the only space topic was the Stardome planetarium.

## Thinktank

We have the planned images display in the planetarium corridor from September 2016 which we estimate 40,000 visitors will see.

We have also included the schools program into the main education program so enable schools to book it till at least July 2017.

## W5

W5 have acquired a six metre inflatable planetarium which has been successfully tested with schools and public. This has been included in our outreach programme and will be available for schools next academic year (2016/17). The planetarium will be used to show Principia FullDome clips and a FullDome movie shot by Tim Peake touring through the ISS and has strong narration by a trained W5 staff member.

It is W5's intention to continue promoting the work of the UK Space Agency and ESA through the integration of the Destination Space family show, Key Stage 1 -3 workshops and planetarium into our core education programme ensuring that the inspirational work carried out on board the ISS during the Principia Mission is used to encourage a new generation to consider careers in the space industry.

## Winchester Science Centre

The core ethos of 'engaging, inspiring and involving UK families and school children...' has been fully embraced by the Education team at Winchester Science Centre. The content and material developed for Destination Space will have a lasting legacy in the form of new Space Science based workshops which will focus on the wide ranges of careers and expertise required to facilitate missions such as Principia.

Staff have taken concepts and demonstrations learnt from the Destination Space Programme and incorporated it into other shows and resources and the Destination Space Programme has been partial inspiration for a major new zone within the Science Centre.

## World Museum (Liverpool)

The World Museum team has loved delivering Destination Space which has enabled staff to appreciate afresh the value of space as a vehicle for communicating about science to a wide audience.

The Cosmic Classroom live link to Tim on board the ISS was a highlight and the event is now screened in the Museum's space gallery. The Museum plans to host a talk by Tim at the Museum to 800-1,000 visitors.

The Museum will continue to run the Destination Space family show and demonstrations suitably modified to ensure sustainability. It is highly successful and the education team values the skills, confidence and resources it has acquired. The team has identified the KS1 school show as having potential for integration to its schools education programme.

Through Destination Space staff at World Museum have forged and strengthened significant links with other organisations which have potential for future collaborations such as the Astrophysics Research Institute of Liverpool John Moores University, the School of Sport and Exercise Sciences of Liverpool John Moores University, Department of Computer Science of the University of Liverpool, TES, the UK Space Agency, Liverpool Astronomical Society, Chester Astronomical Society, Runcorn and Widnes Astronomy Group, Mission X, MERSEYSTEM.

World Museum is seeking to refurbish its space gallery in collaboration with the Astrophysics Research Institute of Liverpool John Moores University. Upgrades have been made in the Museum's planetarium schedule (June 2016) reflecting the public's interest in space. These last two changes stand independently of Destination Space and the latter programme has strengthened resolve to seize the opportunities offered by developing the space theme in the Museum.