

**9 – 12 September 2013**

***Living Planet Symposium***  
***School Lab***

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***Living Planet Symposium (LPS) Overview: 9 – 13 September***

The Living Planet Symposium (LPS) is a conference to present the results of the ESA Earth Observation (EO) missions. It provides a forum for investigators to discuss results of ongoing science on the ERS, ENVISAT, GOCE, SMOS, CRYOSAT, Swarm and ESA Third party missions, reviews the development of applications, introduces operational services such as GMES, reports on ESA Exploitation Programmes, DUE, VAE and STSE, reports on the ESA Climate Change Initiative and international cooperation, and provides ESA toolboxes.

More information can be found here: <http://livingplanet2013.org/index.asp>

The 2013 European Space Agency Living Planet Symposium follows the previous successful symposia held in [Bergen](#) (2010), [Montreux](#) (2007) and [Salzburg](#) (2004).

The symposium will include an exhibition with the following exhibitors:  
<http://livingplanet2013.org/exhibitors.asp>

The conference programme can be downloaded here:  
<http://livingplanet2013.org/documents/Programme.pdf>

The main programme finishes each day at 17:20 followed by the poster session until 19:00 (in the exhibition hall) except for Monday and Friday.

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***School Lab Overview: 9 – 12 September***

The School Lab was originally devised by Professor Meier of the DLR in 2000. This initiative opened a radio laboratory in Göttingen for school students. Due to its success additional, more comprehensive labs were opened in Berlin, Braunschweig, Bremen, Köln, Neustrelitz, Oberpfaffenhofen, Lampoldshausen/Stuttgart and at two partner universities: TU Dortmund and TU Hamburg-Harburg. Since then over 100,000 students have attended DLR School Labs and “experienced for themselves the ‘fascination of research’ by conducting their own experiments” and Kiel University have conducted a study to demonstrate the long-term effects of the labs on encouraging young people to study natural sciences.

More information can be found here: <http://www.dlr.de/schoollab/en/desktopdefault.aspx>

In 2012, the DLR worked with ESA to bring School Lab experiments to the IGARSS (IEEE Geosciences and Remote Sensing Symposium) in Munich. These experiments were combined with lectures and computer practicals based on Eduspace and run by ESA.

More information can be found on Eduspace here:



[http://www.esa.int/SPECIALS/Eduspace\\_EN/](http://www.esa.int/SPECIALS/Eduspace_EN/)

In addition, 3D demonstrations on EO were also made available to the general public using the ESA virtual reality theatre.

In 2013, the DLR, ESA and the UK Space Agency will bring this format of the School Lab to the LPS in Edinburgh; hosting experiments, demonstrations and computer exercises with the aim of teaching students and teachers the science and technology behind Earth Observation.

The registrations page for participants can be found here:

<http://www.bis.gov.uk/ukspaceagency/news-and-events/2013/Jun/register-for-living-planet-symposium-school-lab>

Below is the flyer used for advertising the LPS School Lab sessions (with photos from IGARSS). This flyer has distributed using the following networks:

#### Educator networks

- University of Glasgow STEM ambassador network
- ESERO Space Ambassadors in Scotland
- University of Edinburgh SciFun ambassadors
- CEOS Working Group on Capacity Building & Data Democracy (WGCapD)

#### School networks

- (As above) ESERO Space Ambassadors in Scotland
- 800 x Scottish schools via the Scottish Schools Science Equipment Research Centre (SSERC) - chemistry and biology mailing lists, Twitter feed @ssercphysics, Facebook page
- Edinburgh Schools via the government Science Quality Improvement Officer
- Scottish schools via Scottish Earth Science Education Forum
- The National STEM Centre ESERO-UK
- The National Space Academy

The sessions have been re-advertised in mid-August when the school year began in Scotland.

The School Lab fits into the Scottish school curriculum as follows:

- Remote sensing is one of the suggested learning activities in Higher Environmental Science. It is not compulsory, but most students studying for this qualification will cover remote sensing. For more information see: [http://www.sga.org.uk/files\\_ccc/CfE\\_CourseUnitSupportNotes\\_Higher\\_Sciences\\_EnvironmentalScience.pdf](http://www.sga.org.uk/files_ccc/CfE_CourseUnitSupportNotes_Higher_Sciences_EnvironmentalScience.pdf)
- The activities also link to Highers and Advanced Highers\* in biology, chemistry, geography, physics and environmental studies.
- This activity is also a good demonstration of the interdisciplinary nature of science, a topic that schools are encouraged to promote.

\* Higher and Advanced Highers are qualifications worked towards by 16 – 18 year old students in Scotland.

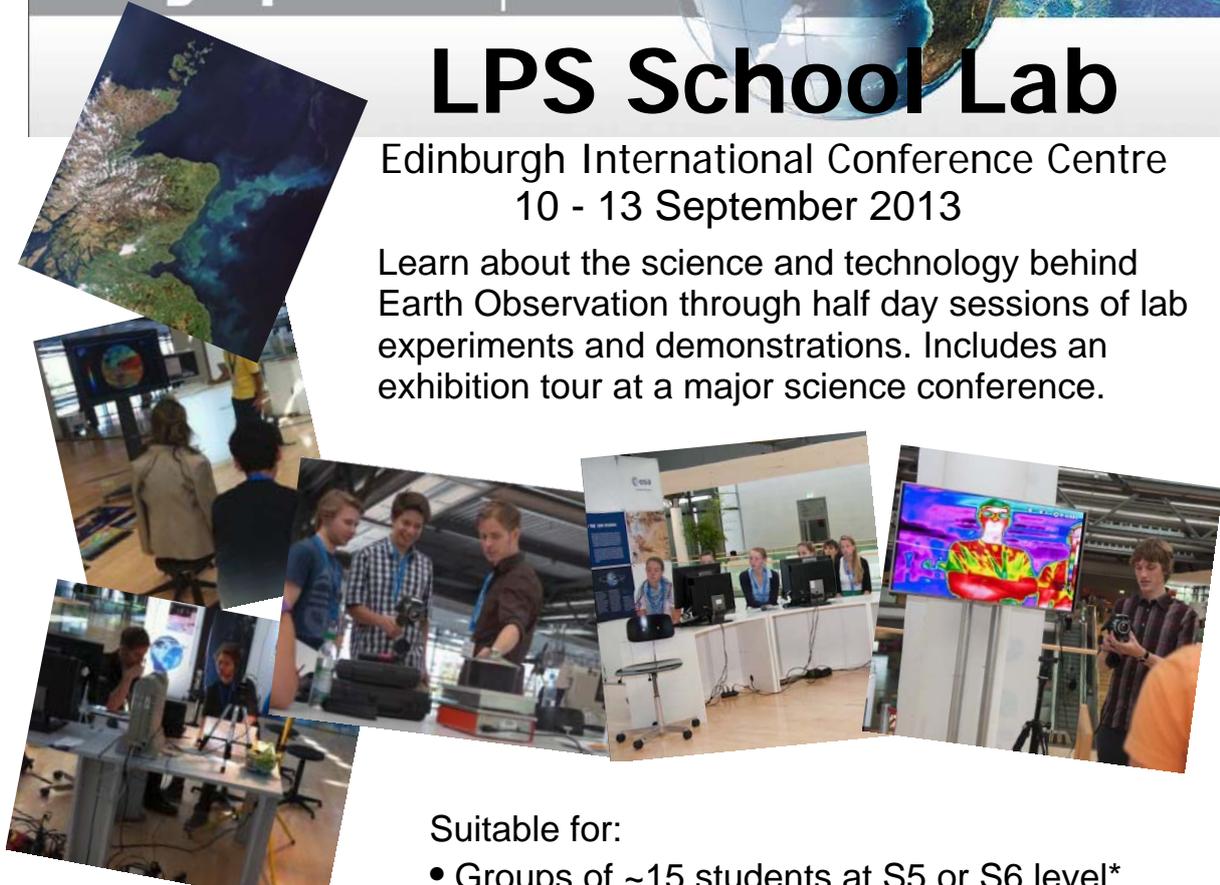
**living planet symposium** EDINBURGH  
09-13 September  
**2013**



# LPS School Lab

Edinburgh International Conference Centre  
10 - 13 September 2013

Learn about the science and technology behind Earth Observation through half day sessions of lab experiments and demonstrations. Includes an exhibition tour at a major science conference.



Suitable for:

- Groups of ~15 students at S5 or S6 level\*
- CPD sessions available for educators

\* Includes content that complements the Biology, Chemistry Geography, Physics Highers and Advanced Highers and provides a clear example of interdisciplinary science

**For FREE registration and information visit:**

<http://www.bis.gov.uk/ukspaceagency/news-and-events/2013/Jun/register-for-living-planet-symposium-school-lab>

Image credit: ESA and DLR

## Session format

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- There will be an all-staff-briefing at the School Lab at **11.00 on Monday 9 September**.
- The School Lab will run from **Monday 9 September – Thursday 12 September**.
- Each session will be **2.5 hours** in length.
- Sessions can accommodate up to **15 individuals** of either educators or students.
- With the exception of Monday 9 September, there are **3 sessions each day** as follows:

9.00 – 11.30  
 12.00 – 14.30  
 14.30 – 17.00

On Monday there will be only one session from 14.30 – 17.00. **VIPs may be visiting after the plenary session:**

- Jean-Jacques Dordain - Director General, ESA
- Volker Liebig - Director of Earth Observation Programmes, ESA
- Philippe Brunet - Director at DG Enterprise and Industry, Directorate of Aerospace, Maritime, Security and Defence Industries, European Commission
- Alan O'Neill - Chairman of ESAC

Participants will arrive and register at the main registration desk for the LPS. They will be given a conference badge with the words "School Lab" written in bold red.

Each session will be split as follows:

| Time        | Activity                          |
|-------------|-----------------------------------|
| 0.00 – 0.10 | Introduction                      |
| 0.10 – 0.50 | Activity 1                        |
| 0.50 – 1.30 | Activity 2                        |
| 1.30 – 2.10 | Activity 3                        |
| 2.10 – 2.30 | Exhibition tour / 3D ESA activity |

### Introduction (10 min)

*Juerg Lichtenegger*

A brief introduction to the School Lab, a couple of sentences on each activity, and splitting the participants into 3 groups of 5.

### Activities 1, 2 and 3 (40 min each)

Parallel sessions where groups of 5 individuals will alternate between the following activities:

#### 1. UK Space Agency (delivered mainly by National Space Academy) - The Living Planet - Earth, Earth Observation and other Earth-like worlds in the Solar System

*Anu Ojha, Hannah Garrett and NCEO volunteers*



The Living Planet activity ultimately encourages students to go away and explore Earth Observation and Earth-like world exploration in their own time using the many tablet apps currently available. The activity starts with an overview of the Earth atmosphere-surface system mainly through the display of images in the visible spectrum. Thermal imaging experiments will then be performed in which water is heated to different temperatures and sensed by an array of instruments, including use of thermochromic film and thermal infrared imaging. From this students are introduced to how temperature differences are a major driver of oceanic circulation and currents. Using images from EO satellites, including ENVISAT, real life data on this phenomenon is presented to the students. Students are then shown how this data can be easily accessed and explored on their own tablet-based technologies using apps such as Living Earth, EarthNow and ESA CryosatHD. Finally, these images and data are compared to those found for Earth-like worlds in our Solar System, including Venus, Mars and Titan, revealing to students what is unique about our living planet.

## **2. DLR - 'Optical Remote Sensing' experiment consisting of a surface field spectrometer and an infrared camera.**

*Dieter Hausamann, Matthias Locherer, Nicola Schneider and Martin Danner*

The activities provided by DLR include optical remote sensing experiments, using a surface field spectrometer and an infrared camera. In this experiment students engage in various types of equipment and technologies used to measure changes in the environment. The focus thereby is on measuring radiation in different parts of the electromagnetic spectrum. A portable field spectrometer analyses the spectrum range of the visible and short-wave infrared and an infrared camera measures the thermal radiation. First there is an introduction in function and operation of the instruments. Afterwards measurements are taken, so the students can learn something about the reflection and also emission characteristics of various surfaces, e.g. vegetation in different vital states or the non-visible heating of a filament current-carrying.

## **3. ESA - Satellite Image Processing (computer exercises)**

Parallel sessions :

1) *Juerg Lichtenegger (LEOWorks point of contact) and Val Byfield (may also be present on UK Space Agency stand)*

The ESA activities will include computer practical sessions in which students are exposed to satellite images acquired by a variety of different sensors. Students will learn how to process these images using software specifically developed for secondary school students (LEOWorks 4). The image processing that the students will become familiar with range from basic handling of multispectral images, such as generating three colour composites and contrast stretching, to processing for specific applications, such as change detection analysis.

*Juerg Lichtenegger*

This will include an exercise with Envisat Meris and ASAR images from the Edinburgh area for different seasons: Students relate a series of photographs to specific times and locations in the satellite images. This could also be done for selected locations around the world. Exercise will be translated from Bilko to L4. Val to produce materials in BILKO by 5 August.

*Val Byfield*



Multispectral analysis of area around Edinburgh. Optical satellite imagery from various sensors and acquired at various times over the Edinburgh area are analysed using the LEOWorks software. Processing includes contrast enhancement, creation of different band combinations and calculation of vegetation indices.

## 2) *Massimo Cuomo*

A 3D activity in which students watch with the aid of 3D glasses a demonstration of the technical characteristics of ESA Explorer satellites, and visualise their data.

### **Exhibition Tour (20 min)**

*Madeleine Russell / other UK Space Agency staff member*

Hannah Garrett will take all 15 individuals down to Exhibition Hall to be met by Madeleine or another UK Space Agency staff member who will then deliver a short intro about careers available in the space sector, with a focus on Earth observation, and a tour of the UK Space Agency stand, the ESA stand, and other key exhibiting stands. This will give participants a chance to talk to scientists and other individuals working on earth observation.

Tour timings have been chosen to avoid main conference coffee breaks.

### ***School Lab set-up and take-down***

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#### **Set-up: Sunday 8 September all day.**

The Strathblane Hall and Atrium Entrance Level can be accessed from 07.00 on 8 September.

Soft-build can start from 12.00 on 8 September. There is one exception to this. Juerg Lichtenegger will be attending from 9.00 on 8 September to monitor set up by 3A.

3A – setting up walls and click panel  
EUROMOD – setting up 3D activity  
EICC – provide furniture and computers at 15:00 on 8 September

#### **Shipment**

Any materials that need to be shipped can be sent to the following address:

Edinburgh International Conference Centre  
Loading Bay  
Off West Approach Road  
Edinburgh  
EH3 8EE

Storage of all exhibition material will be in the Cromdale Hall, Level -2.

The contact at EICC for these deliveries is:

EICC Security Control Room  
Available 24hrs  
Telephone number: 0131 519 4000.  
Reference name: "Living Planet 2013"



Take down: Friday 13 September 08:00 to 11:00 hours.

Return time for equipment on 13 September is 13.00.

Return Shipment time is 13 September at 12.00.

Items for return shipment should be put in either the Cromdale or Lennox rooms and collection should be arranged by the owner (not the ESA Conference Bureau) from these rooms.

Representatives present for set-up and take down:

UK Space Agency – Hannah Garrett

ESA - Juerg Lichtenegger

DLR – Not available before 19.30 on 8 September.

### ***Group equipment***

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Equipment hire is being arranged by ESA.

Venue approx. 100 m<sup>2</sup>

30 chairs

All tables 1835mm in length and 765mm wide

Electricity available through extension leads

WiFi and Wired internet connection

Click panel (4200 x 300 x 2400 mm):



Equipment in black to hire

Equipment in grey being provided by group running activity

#### **DLR**

- 1 x 42" LCD screen including VGA and HDMI inputs
- 2 x PCs
- 2 x long tables (approx. 2000 x 900 x 750 mm)
- 2 x small tables (approx. 1200 x 800 x 750 mm)
- WiFi
- Poster boards
- Cables
- Heating plate
- 2L pot
- ASD field spectrometer + accessories
- Infrared camera + accessories
- White reference
- Pyrometers
- Notebook
- Pot plant, 15 – 30 cm in height ideally with some broad leaves (~ 5 cm diameter) (to be provided by UK Space Agency)
- 1-2 kW lamp (to be provided by UK Space Agency)

#### **ESA**

- 1 x 42" LCD screen including VGA and HDMI inputs
- 2 x oval tables (approx. 1600 x 1200 x 750 mm)
- 6 x PCs (Windows installed for students and teachers)
- 6 x monitors (5 for students, 1 for teacher)
- 6 x 3D glasses (Massimo to bring)
- 1x rack/stand on which to mount 3D monitor
- 1x computer suited for 3D with VRT software both rented by ACS - for the 3D virtual reality demo (of the GOCE satellite).
- 1x monitor attached to the computer (HD 1920x1080) – to go on table

#### **UK Space Agency**

- 1 x 42" LCD screen including VGA and HDMI inputs
- 2 plug sockets; 1 to one side of the table, 1 near the screen.
- 2 x oval tables (approx. 1600 x 1200 x 750 mm)
- WiFi or fixed line if WiFi weak signal
- Hot and cold water supply
- 5 x iPad3s with apps loaded
- 1 VGA adapter
- 1 HDMI adapter
- Infrared camera
- Thermochromic film
- Baking trays
- Laptop

## **School Lab running**

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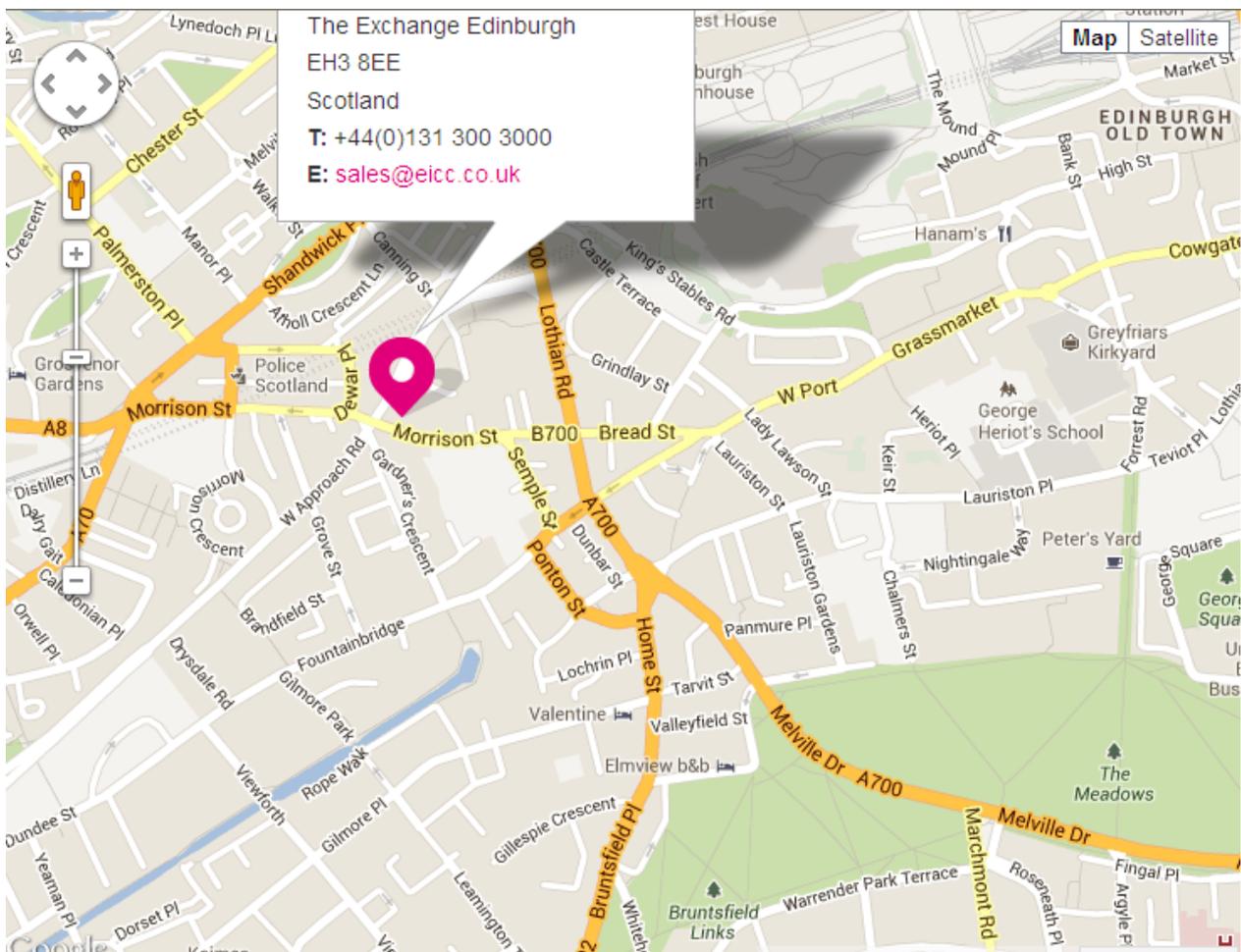
Staff need to be at the School Lab from **14.00 – 17.30** on 9 September.  
Staff need to be at the School Lab from **8.30 – 17.30** on 10, 11 and 12 September.

The on-the-day coordinator is **Hannah Garrett**.

## **Conference Venue**

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Edinburgh International Conference Centre (EICC), The Exchange, Edinburgh, EH3 8EE  
T: +44 (0) 131 300 3000



### **Travel by Train**

Edinburgh has two railway stations - Waverley and Haymarket. Waverley is the main station and has over 25 daily departures from London. For more information visit [www.eastcoast.co.uk](http://www.eastcoast.co.uk) or [www.nationalrail.co.uk](http://www.nationalrail.co.uk)

### **Travel by Plane**

The EICC is within 10km (6 miles) of Edinburgh International Airport. For more information visit [www.edinburghairport.com](http://www.edinburghairport.com).

It costs approximately £15 to get a taxi from the airport to the city centre and the journey takes approx. 20 minutes dependent on the time of day.

The Airlink 100 operates a frequent bus service (every 10 minutes at peak times) between Edinburgh Airport and the city centre, with designated stops en route. The service starts at 04.30 and runs until 00.22 at night, with the journey taking 20 minutes. Tickets cost £3.50 single and £6.00 return. Delegates are advised to disembark at Haymarket Railway Station and to follow signs for EICC on foot (5 minute walk).

The N22 bus also departs from outside the Airport entrance and runs every half an hour through the night until the Airlink service starts again. For more information visit [www.flybybus.com](http://www.flybybus.com).

### Travel by car

The EICC is in the centre of Edinburgh near the castle. The main entrance is on Morrison Street and the postcode for SatNavs is EH3 8EE.

There are several car parks in close walking distance to the EICC. Visit <http://www.npc.co.uk/find-a-car-park>

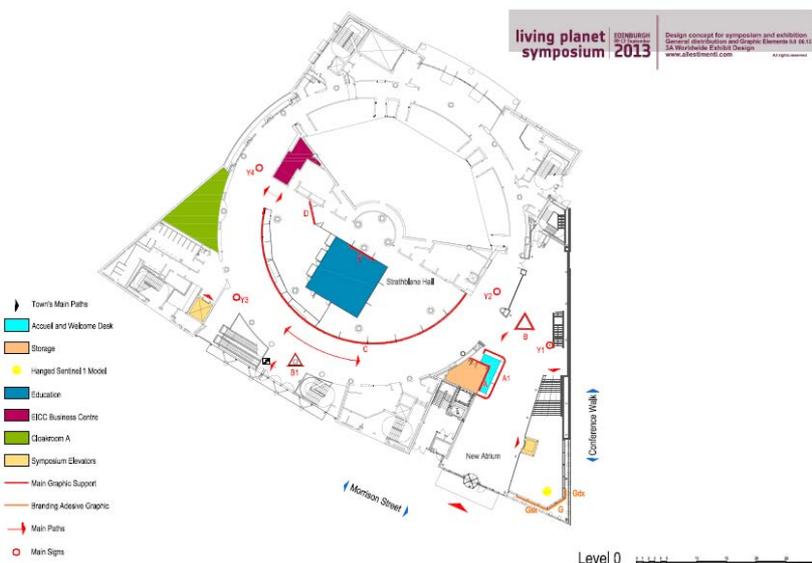
There is a public car park at the Sheraton Hotel, 150 meters from the EICC, which has limited accessible parking spaces. For further details please see [www.sheratonedinburgh.co.uk/car-park](http://www.sheratonedinburgh.co.uk/car-park)

### Travel by bus within Edinburgh

Lothian Buses serve Edinburgh and the areas around the city with a frequent and reliable transport service. Use the [Lothian Buses](http://www.lothianbuses.com) website to plan your journey to the EICC. And download the [MyBusTracker](http://www.lothianbuses.com/mybus-tracker) app for access to real time bus information in and around the city.

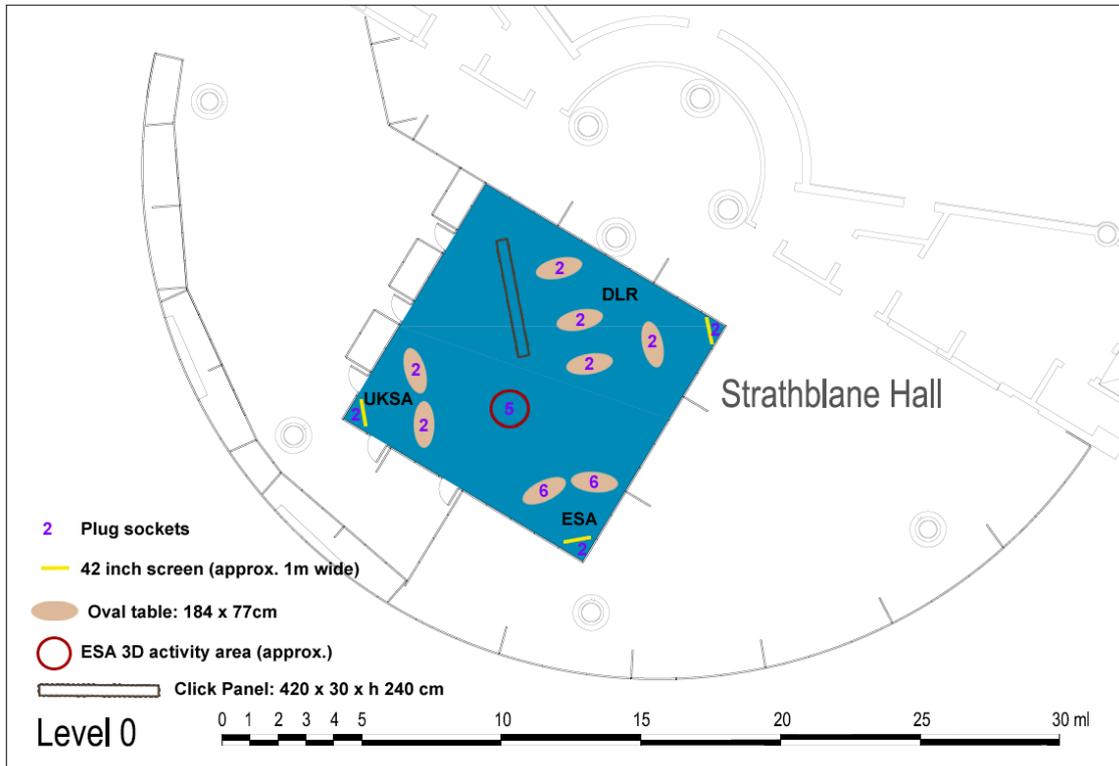
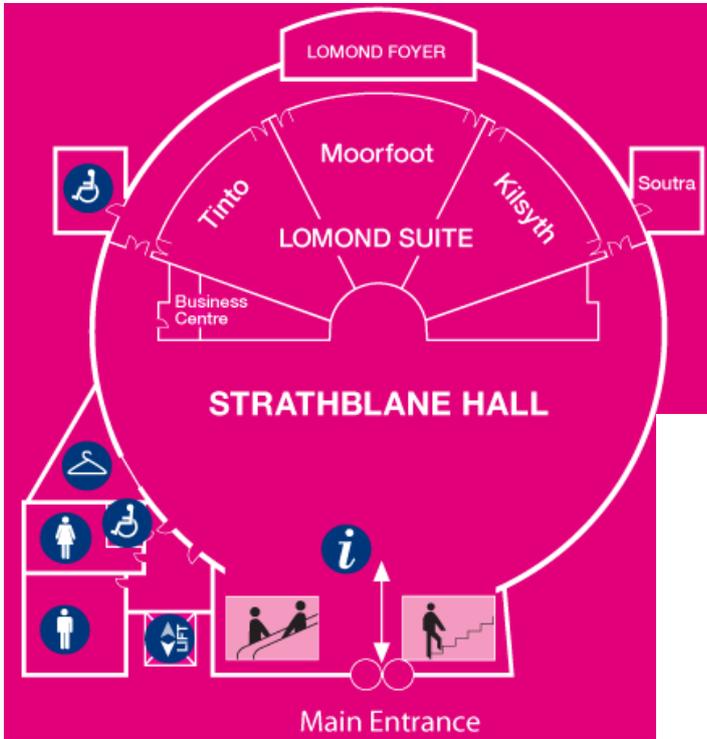
### Hotels

UK Space Agency staff will be staying in the Apex International Hotel, 31-35 Grassmarket, Edinburgh, EH1 2HS (+44 (0)131 300 3456)

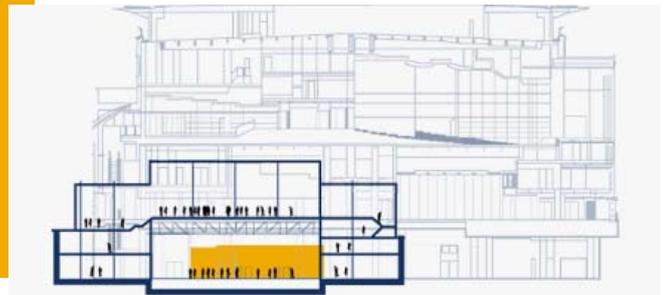
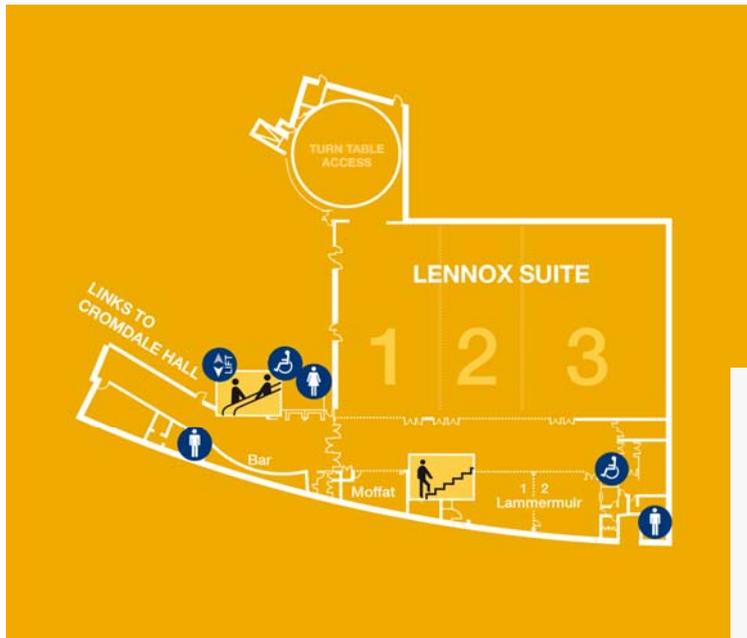
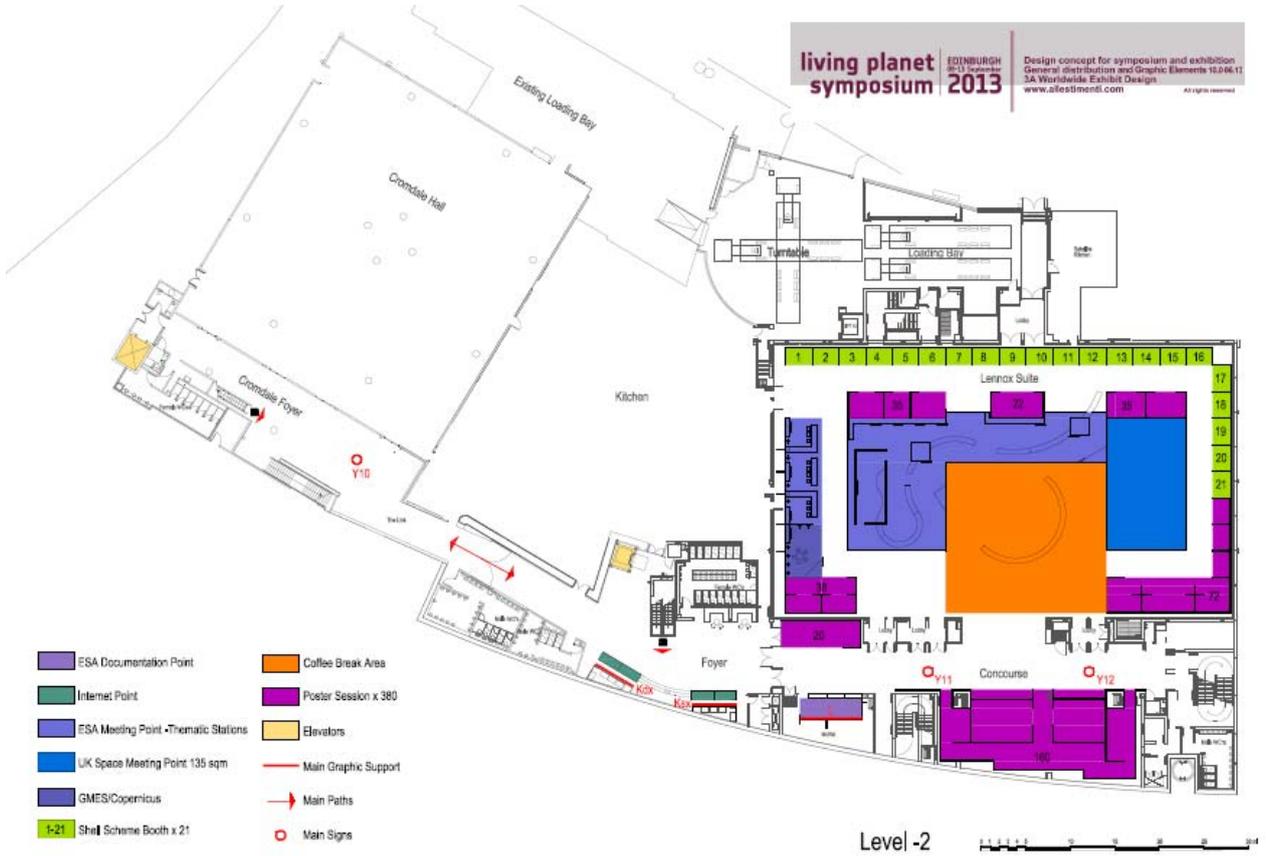


The blue square on this diagram is the Strathblane Hall. The School Lab will be taking place in the central enclosed area of the Strathblane Hall. This is on Level 0.

This will have walls round it to avoid seeing the back side of the 'main graphic support' wall.



The exhibition tour will take part in the Lennox Suite on Level -2:



### ***School Lab Programme***

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Bookings for the School Lab status Sep 5, 2013:

| Date and time of session | Type of session | School / individuals booked in    |
|--------------------------|-----------------|-----------------------------------|
| Monday 14:30             | School          | SCHOOL#1                          |
| Tuesday 9:00             | School          | SCHOOL#2                          |
| Tuesday 12:00            | School          | SCHOOL#3                          |
| Tuesday 14:30            | Educator        | Teachers & Symposium Participants |
| Wednesday 9:00           | School          | SCHOOL#4                          |
| Wednesday 12:00          | School          | SCHOOL#2                          |
| Wednesday 14:30          | Educator        | Teachers & Symposium Participants |
| Thursday 9:00            | School          | SCHOOL#5                          |
| Thursday 12:00           | School          | SCHOOL#2                          |
| Thursday 14:30           | School          | SCHOOL# 6                         |