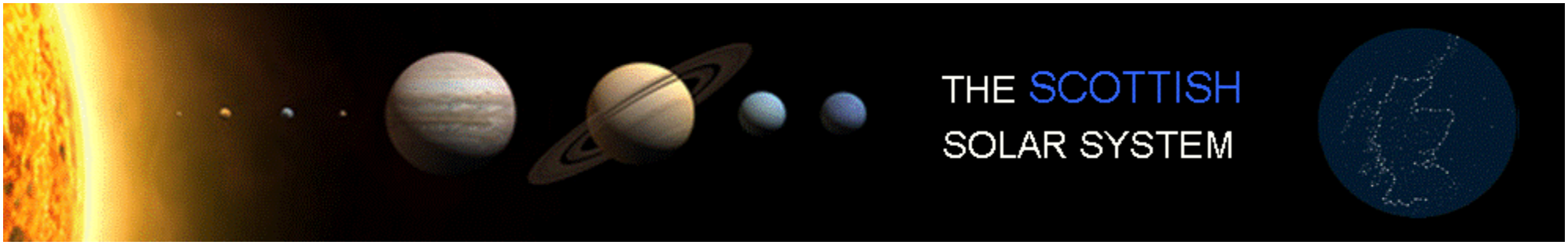


The Scottish Solar System

Martin Hendry
University of Glasgow

martin@astro.gla.ac.uk

Overview

Scotland has a strong record of public engagement in astronomy, including close collaboration between the amateur and professional communities.

In 2009 a pan-Scotland project called the **Scottish Solar System** coordinated more than 50 public and schools astronomy outreach events across the country. The project ran in partnership with the **Dark Sky Scotland** programme, with funding from the Scottish Executive.

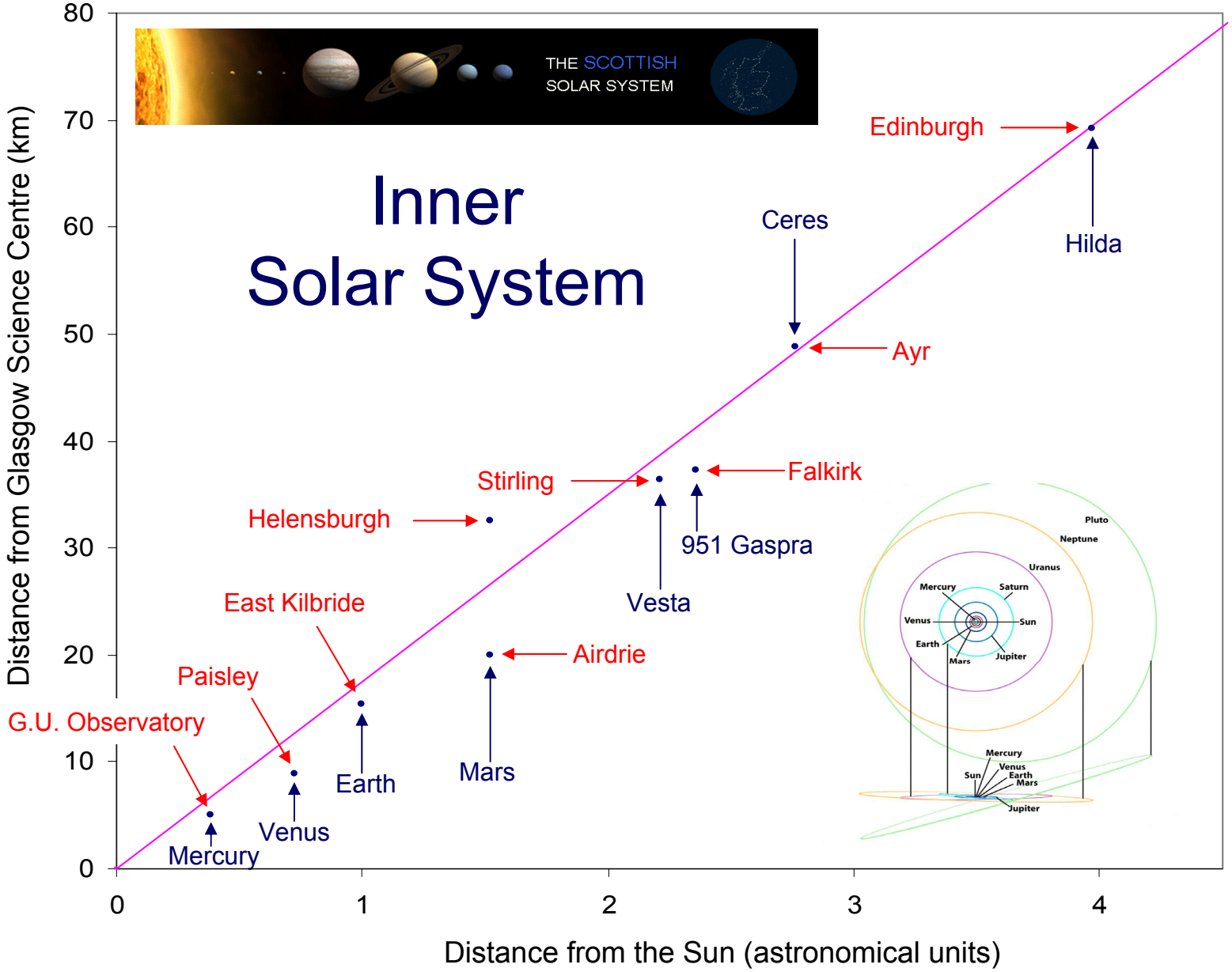
Creating the Scottish Solar System

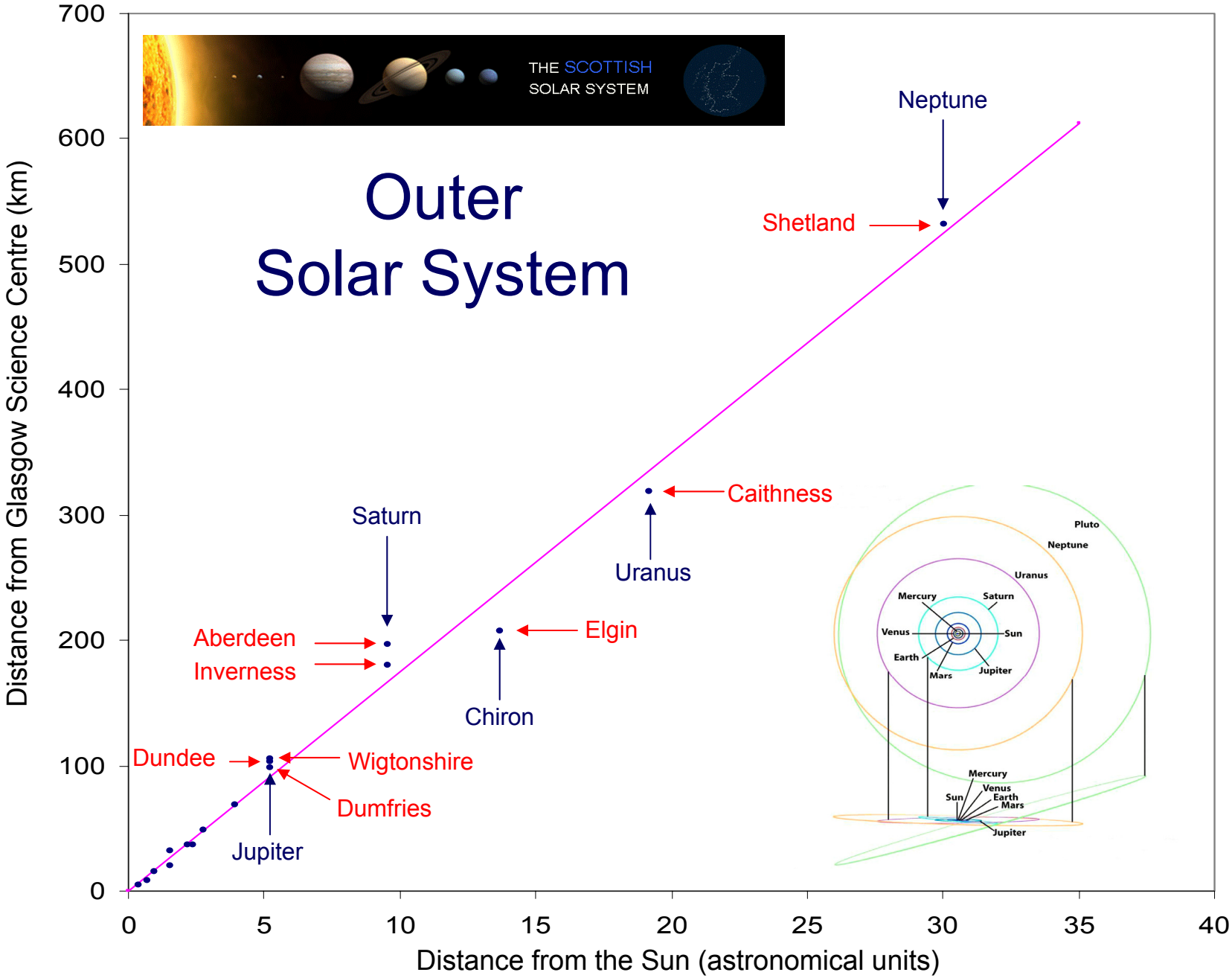
In Autumn 2009 we created a (remarkably accurate) **scale model** of the Solar System – with Glasgow Science Centre as the Sun and with correctly-scaled objects representing planets, moons and asteroids displayed throughout the country.

We believe our **Scottish Solar System** model is the largest ever created!

Below we highlight some of our Scottish Solar System events, or visit our website to find out more….

http://www.scottishsolarsystem.org.uk


THE SCOTTISH
SOLAR SYSTEM
Inner
Solar System
Distance from Glasgow Science Centre (km)
Distance from the Sun (astronomical units)
0
10
20
30
40
50
60
70
80
0
1
2
3
4
Edinburgh
Hilda
Ceres
Ayr
Falkirk
Stirling
Helensburgh
951 Gaspra
Vesta
East Kilbride
Airdrie
Paisley
G.U. Observatory
Earth
Mars
Venus
Mercury
Pluto
Neptune
Uranus
Saturn
Jupiter
Sun


THE SCOTTISH
SOLAR SYSTEM
Outer
Solar System
Neptune
Shetland
Caithness
Saturn
Uranus
Aberdeen
Inverness
Elgin
Chiron
Dundee
Wigtonshire
Dumfries
Jupiter
Distance from Glasgow Science Centre (km)
Distance from the Sun (astronomical units)
0
100
200
300
400
500
600
700
0
5
10
15
20
25
30
35
40
Pluto
Neptune
Uranus
Mercury
Saturn
Venus
Sun
Earth
Mars
Jupiter

Solar system model

Scale models in various locations

Several towns and institutions have built outdoor scale models of the solar system. Here is a table comparing these models.

Scale Models of the Solar System

Location	Scale	Sun dia.	Earth dia.	Sun-Earth	Sun-Pluto
Actual statistics	1:1	1.392 Gm	12.76 Mm	149.6 Gm	5.914 Tm
Scottish Solar System Project (http://www.scottishsolarsystem.org.uk/)	1:8,200,000	170 m	1.56 m	18.3 km	551 km (Neptune)
Sweden Solar System	1:20,000,000	71 m	65 cm	7.6 km	300 km
Solar System Drive, 2007, Coonabarabran, NSW, Australia (http://www.solarsystemdrive.com/about-the-project.html)	1:38,000,000	37 m	34 cm	4.1 km	205 km
Upstate New York from Syracuse, New York	1:46,500,000	25.6 m	305 mm (1 ft)	3.5 km	138 km
University of Maine at Presque Isle	1:93,000,000	15 m	137 mm	1.6 km	64 km

World's biggest Solar System model

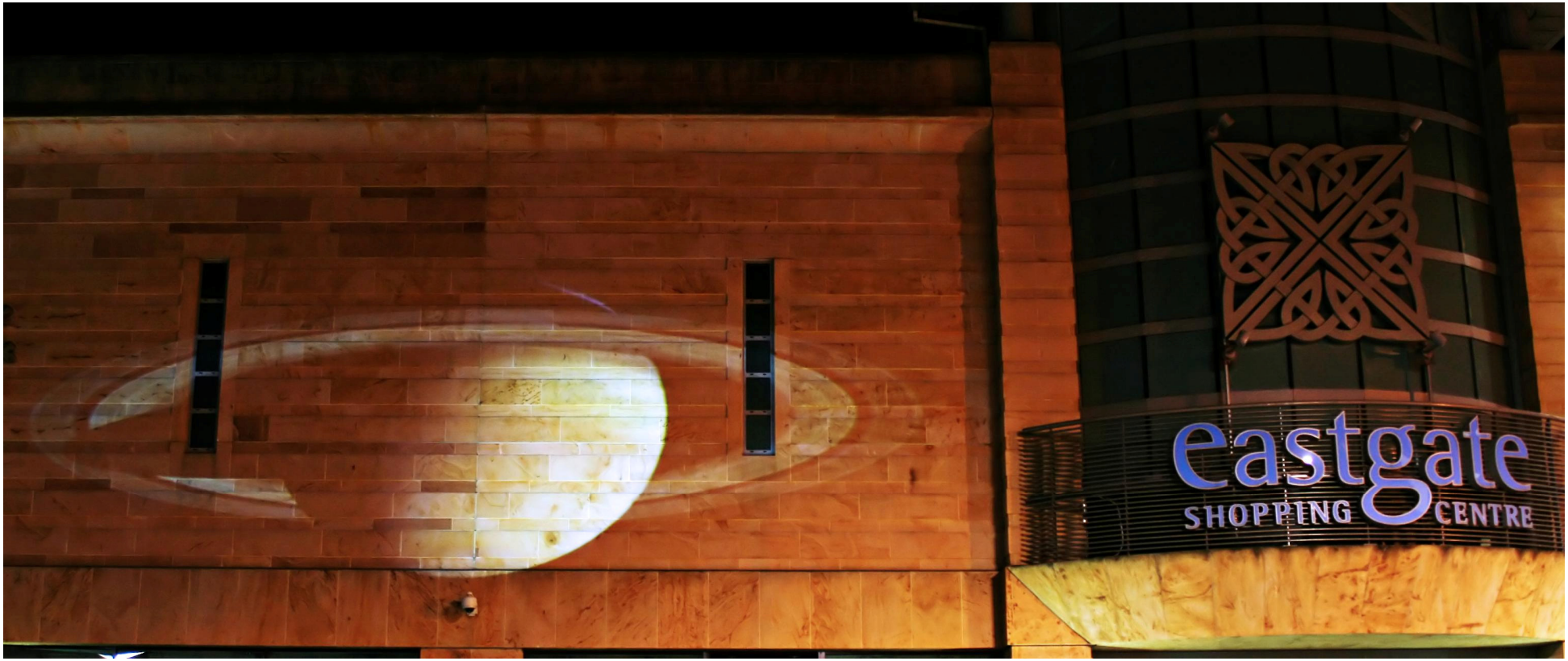
IYA2009 Events

The project was led by Glasgow University and Glasgow Science Centre and featured events hosted by 14 Astronomy clubs and societies and 6 regional education authorities. Events included:

- Public lectures and workshops
- “Island Universe” outreach tour of the Western Isles
- Dark sky observing sessions throughout Scotland
- Schools Science Fair projects throughout Scotland
- A ‘sleepover’ event for “100hrs of Astronomy”
- Joint Scotland-Australia lunar observing

Glasgow Science Centre (aka the Sun)

Some Enthusiastic “Earthlings” in East Kilbride, Oct 21st 2009



Saturn comes to Inverness

On Saturday Oct 17th 2009 the Highland Astronomical Society projected a correctly scaled image of the planet Saturn onto the Eastgate Shopping Centre in Inverness. On the same scale Saturn's newly discovered E-ring would approximately span the entire city of Inverness.

Caithness scouts creating Uranus. Thurso High School, Oct 30th 2009

The Knab, near Lerwick (Shetland), in the cold outer reaches of the (Scottish) Solar System

Public lecture at Ayrshire Astronomical Society, aka the CD-sized asteroid Ceres

ASTRONOMICAL IDEA IS ON VIEW

By **Donald Morton**

ALVA stargazer Olivia Johnston-Love has been helping the country's top scientists create a giant scale model of the solar system – believed to be the biggest in the world.

Olivia (12) is a member of Stirling Astronomical Society, which is working with Glasgow University, Glasgow Science Centre and astronomy societies throughout Scotland to produce the model and created her version of the asteroid "Vesta", which is now on display in Stirling's Highland Hotel.

In the Scottish Solar System project, the Glasgow Science Centre main building represents the sun and the planet sizes and distances have been worked out on a similar scale stretching out across Scotland as far as Shetland (Neptune).

At actual distances of 40-70km from the science centre, Stirling, Falkirk, Ayr and Edinburgh will mark the Asteroid Belt.

The 71mm size of the Vesta model (about the same size as a CD) contrasts with the 15-metre image of Saturn projected on the walls of the Eastgate Shopping Centre in Inverness, highlighting the vast range of scales in our solar system.

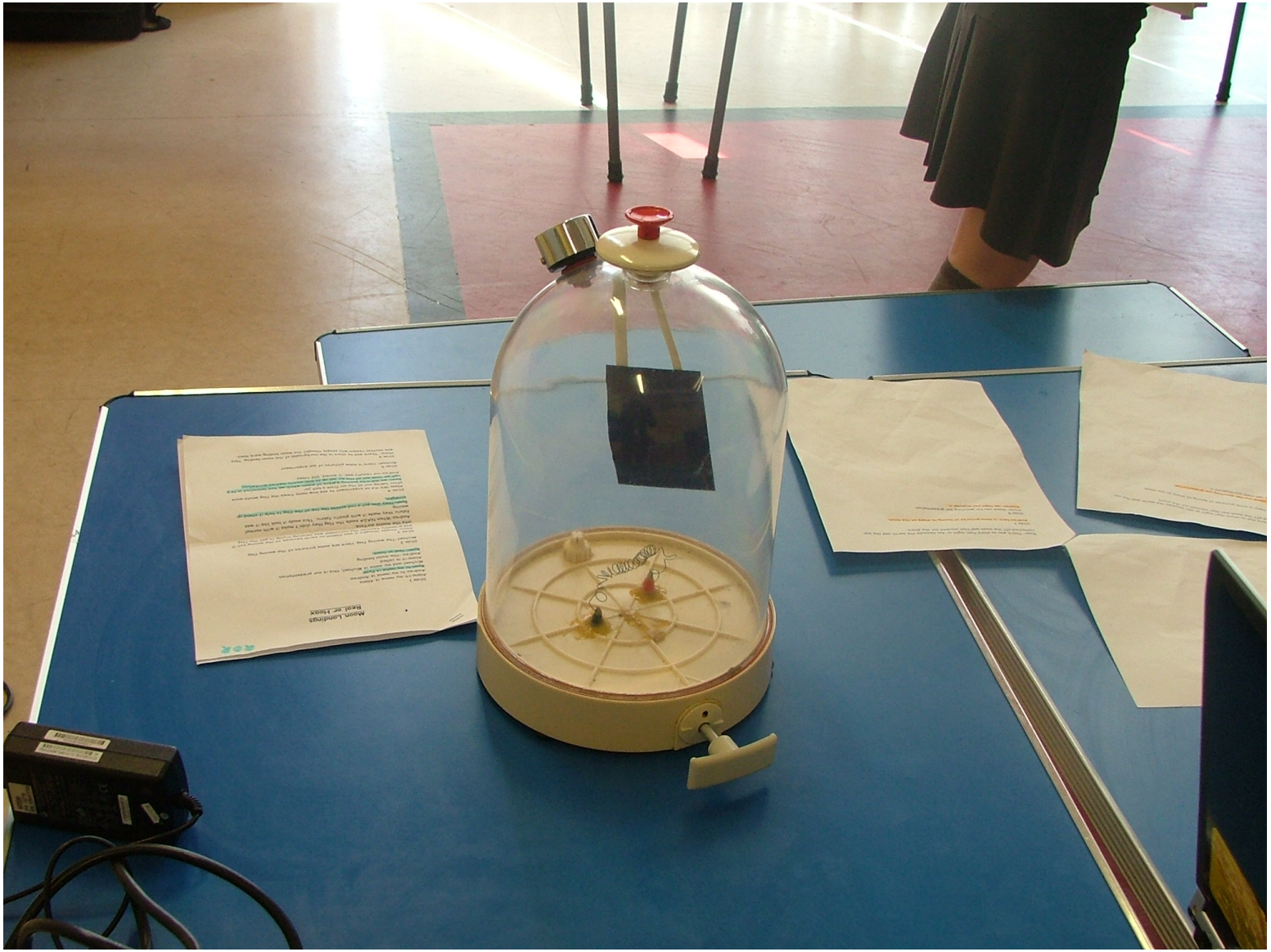
The project will also publicise "Autumn Moonwatch" – an opportunity for members of the public to view the Moon through a telescope in the same way that Galileo did in December 1609. Both events celebrate the International Year of Astronomy – 400 years since a telescope was first pointed at the heavens and 40 years since man first walked on the moon.

The 120-year-old Victorian telescope in the observatory in the Stirling Highland Hotel will be manned by Stirling Astronomical Society members this week from 7.30-9pm. If you wish to join them please book your place on stirlingastronomicalsociety.org.uk, call 01506 824169 or email: kenziebert@tiscali.co.uk.

SPACE STATIONS: Olivia Johnstone-Love with her model of an asteroid on show at Stirling Highland Hotel.

Olivia Johnston-Love's model of Vesta, on display at the Stirling Highland Hotel

Dark sky observing and rocket building in Caithness (aka Uranus)



Debunking the “Waving Flag” Moon Hoax conspiracy theories.
South Lanarkshire school science fairs: April – June 2009.

2009 is International Year of Astronomy

Astronomers across Scotland are teaming up to promote an exciting programme of public astronomy events during **Autumn Moonwatch – October 24th to November 1st 2009**.

From dark sky observing to public lectures and exhibitions, activities will offer something for everyone, and together will create our very own scale model of the Solar System!

With Glasgow Science Centre representing the Sun, astronomy events will take place on 'planets', 'moons' and 'asteroids' all across the country – from Wigtonshire to Shetland.

To find events in your area visit our website at:

http://www.scottishsolarsystem.org.uk

THE SCOTTISH SOLAR SYSTEM

1.	Glasgow Science Centre	*The Sun*
2.	Astronomical Society of Glasgow	*Mercury*
3.	Renfrewshire Astronomical Society	*Venus*
4.	Clydesdale Astronomical Society	*Earth*
5.	Airdrie Astronomical Association	*Mars*
6.	Helensburgh Astronomical Society	
7.	Stirling Astronomical Society	*Asteroid Belt*
8.	Association of Falkirk Astronomers	
9.	Ayrshire Astronomical Society	
10.	Edinburgh Astronomical Society	
11.	Dumfries Astronomical Society	*Jupiter*
12.	Wigtonsire Astronomical Society	
13.	Dundee Astronomical Society	
14.	Highlands Astronomical Society	*Saturn*
15.	Aberdeen Astronomical Society	
16.	Moray's Astronomy Club, SIGMA	*Chiron*
17.	Caithness Astronomy Group	*Uranus*
18.	Shetland Astronomical Society	*Neptune*

Glasgow University PhD students Euan Bennet and Fraser Watson man the telescopes aided by Dylan Shields (left), Tahmina Ghazal, Andrew McDonald, Mark Leaver (front) and Brendan Justice.

Moonstruck at North Muirton

YOUNGSTERS AT a Perth primary linked up with counterparts on the other side of the world for a moon-gazing project last night.

Pupils from North Muirton Primary School met online the children who attend Ardross Primary School in Perth, Western Australia to observe the moon simultaneously.

The Scottish children got the best end of the deal as they turned out at 6pm, while those in Australia had a sleepover in their school library to wake up at 2am to make contact.

Using a video link over the internet the children in both schools exchanged what they could see in the sky using telescopes and taking photographs and making sketches.

Interesting differences were expected. For example the northern hemisphere's "man in the moon" looks decidedly like a rabbit in the south.

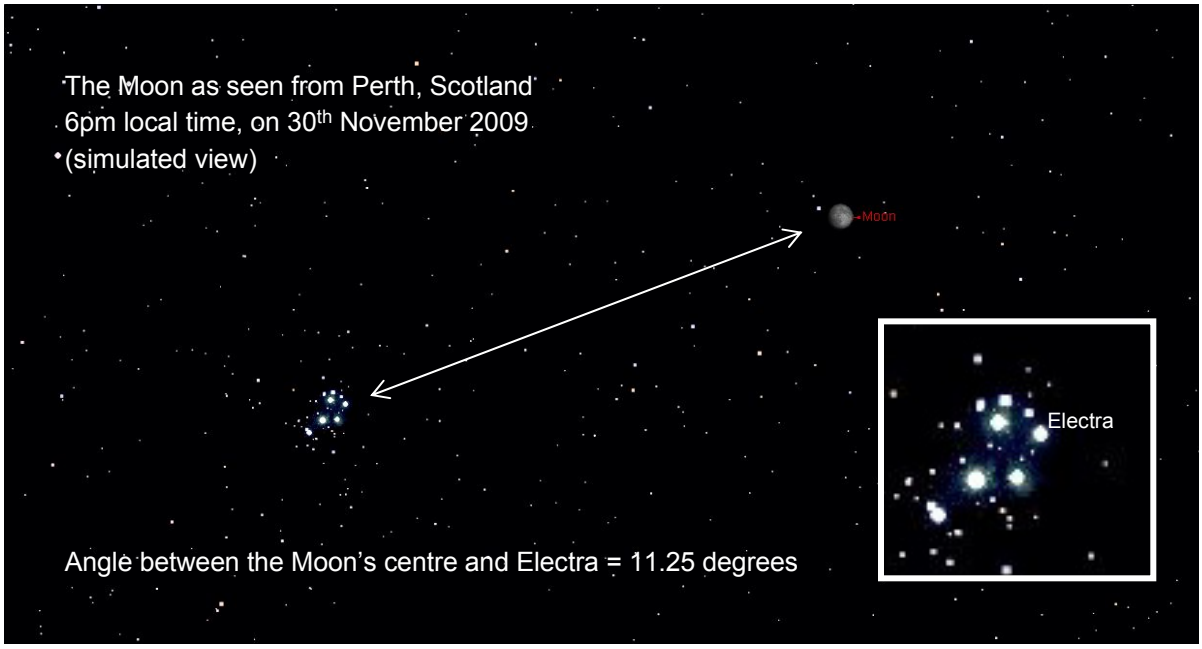
Both schools have been working in conjunction with Dr Martin Hendry of Glasgow University, who designed the project to help celebrate International Year of Astronomy.

Using the data gained in Scotland and Australia he hopes to be able to get the children to calculate the distance between themselves and the moon.

This was the culmination of a week of activities in North Muirton Primary School that has challenged the children to find out more about the stars and planets and to build and test their own rockets.

School pupils in Perth, Scotland who simultaneously observed the Full Moon, along with pupils in Perth, WA, on Nov 30th / Dec 1st 2009.

These observations revealed a small parallax shift, from which the Moon's distance could be estimated.



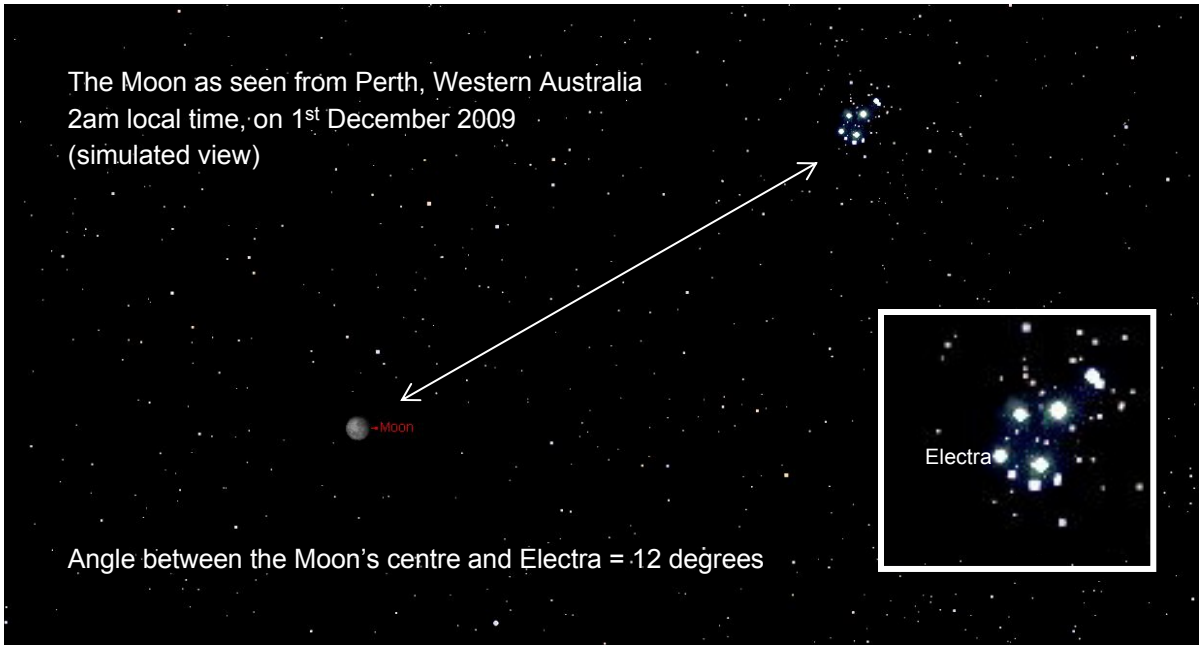
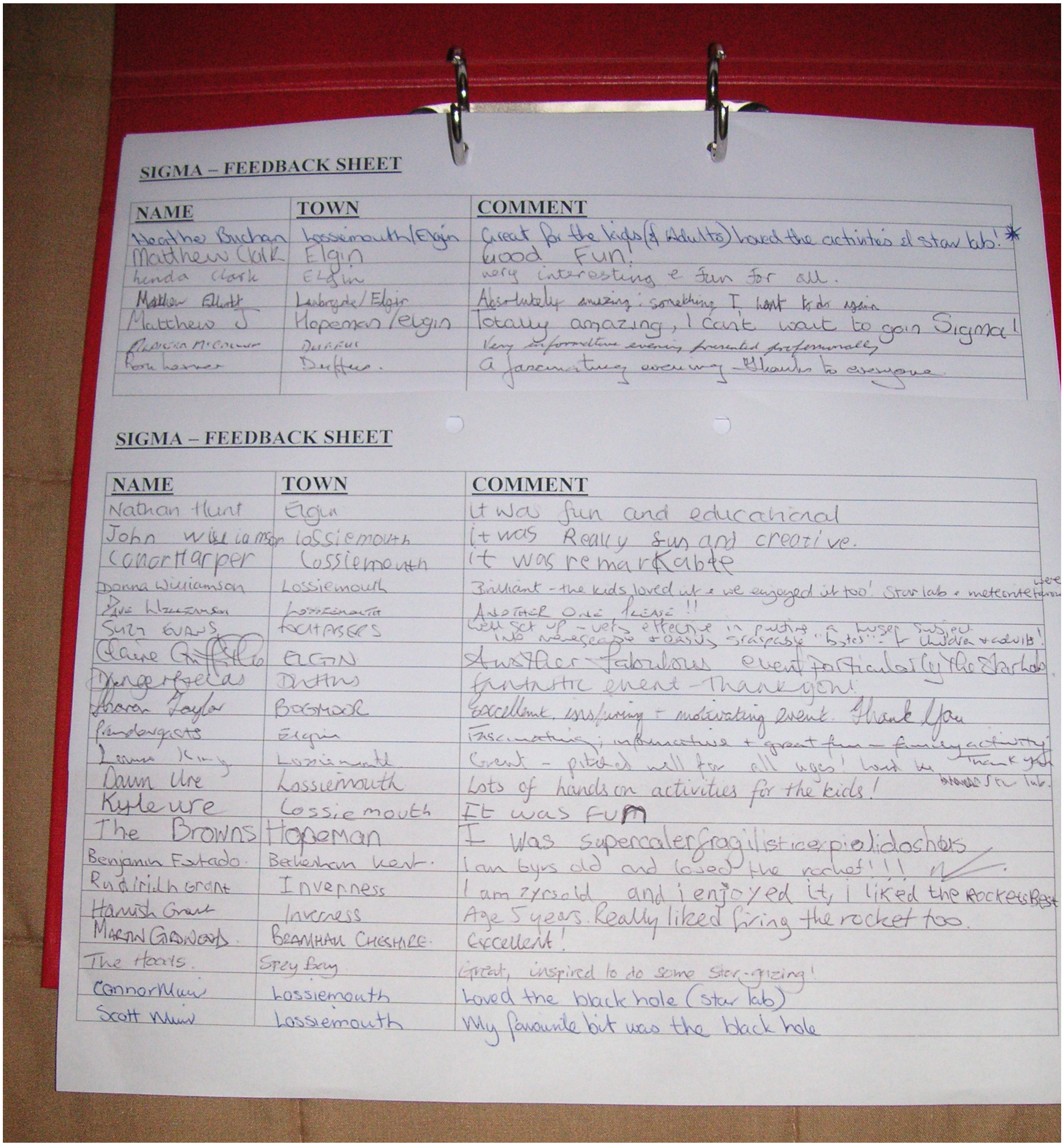


Illustration of the lunar parallax shift observed between Scotland and Australia.

Naked-eye estimates of the parallax angle yielded a lunar distance in the range 280,000km to 570,000km!



SIGMA – FEEDBACK SHEET

NAME	TOWN	COMMENT
Heather Buchan	Lossiemouth/Elgin	Great for the kids (& Adults) loved the activities & star lab! *
Matthew Clark	Elgin	Good Fun!
Linda Clark	Elgin	very interesting & fun for all.
Matthew Elliott	Lanbryde/Elgin	Absolutely amazing: something I want to do again
Matthew J	Hopeman/Elgin	Totally amazing, I can't wait to join Sigma!
[illegible]	Duffus	Very informative evening presented professionally
Ron Larner	Duffus.	A fascinating evening - thanks to everyone

SIGMA – FEEDBACK SHEET

NAME	TOWN	COMMENT
Nathan Hunt	Elgin	It was fun and educational
John Williamson	Lossiemouth	it was Really fun and creative.
Conor Harper	Lossiemouth	it was remarkable
Donna Williamson	Lossiemouth	Brilliant - the kids loved it & we enjoyed it too! Star lab & meteorite were [illegible]
Dave Williamson	Lossiemouth	ANOTHER ONE PLEASE!!
Suzy Evans	Fochabers	Well set up - very effective in putting a huge subject into manageable & easily graspable "bytes" - for children & adults!
Claire Griffiths	ELGIN	Another fabulous event particularly the Starlab.
[illegible]	Duffus	Fantastic event - Thank you!
Sharon Taylor	Bogmoor	Excellent, inspiring + motivating event. Thank you
[illegible]	Elgin	Fascinating; informative + great fun - family activity!
Leanne King	Lossiemouth	Great - pitched well for all ages! Loved the [illegible] Star lab. Thank you
Dawn Ure	Lossiemouth	Lots of hands on activities for the kids!
Kyle Ure	Lossiemouth	It was fun
The Browns	Hopeman	I was supercalerfragilisticexpialidoshes
Benjamin Furtado.	Beckenham Kent.	I am 6yrs old and loved the rocket!!!
Rudiridh Grant	Inverness	I am 7yrs old and i enjoyed it, i liked the Rockets Best
Hamish Grant	Inverness	Age 5 years. Really liked firing the rocket too.
Martin Gardiner.	Bramhall Cheshire.	Excellent!
The Hoads.	Spey Bay	Great, inspired to do some star-gazing!
Connor Muir	Lossiemouth	Loved the black hole (star lab)
Scott Muir	Lossiemouth	My favourite bit was the black hole

An example of our feedback, from the SIGMA (Moray's Astronomy Club) Family Fun Day on October 25th 2009, in Gordonstoun (aka Chiron).