REPORT

On **Wednesday 25th February** a party of eight STAR Group Members visited to **Open Dome Evening at Nottingham Trent University** and heard a talk given by **Dr M. Braddock of the Mansfield &Sutton Astronomical Society (MSAS)** who explored aspects of the Science behind the Fermi Paradox in the Presentation entitled ***"Are we Alone? – The Fermi Paradox."***

This brings into question the work of CETI (Communication with extraterrestrial intelligence) and SETI (Search for Extraterrestrial Intelligence). It questions that given the size of the Universe – the number of Stars including those that may have planets capable of sustaining civilisations of intelligent life – Why haven't any of those Civilisations made contact with us?

Detail: Fermi Paradox

Could we be alone in our part of the galaxy, or more dramatic still, could we be the only technological society in the universe?

Is there obvious proof that we could be alone in the Galaxy? Enrico Fermi thought so -- and he was a pretty smart guy. Might he have been right?

It has been a hundred years since Fermi, an icon of physics, was born (and nearly a half-century since he died). He is best remembered for building a working atomic reactor in a squash court. However, in 1950, Fermi made a seemingly innocuous lunchtime remark that has caught and held the attention of every SETI researcher since.

The remark came while Fermi was discussing with his mealtime mates the possibility that many sophisticated societies populate the Galaxy. They thought it reasonable to assume that we have a lot of cosmic company. But somewhere between one sentence and the next, Fermi's supple brain realized that if this was true, it implied something profound. If there are really a lot of alien societies, then some of them might have spread out.

Fermi realized that any civilization with a modest amount of rocket technology and an immodest amount of imperial incentive could rapidly colonize the entire Galaxy. Within ten million years, every star system could be brought under the wing of empire. Ten million years may sound long, but in fact, it is quite short compared with the age of the Galaxy, which is roughly ten thousand million years. Colonization of the Milky Way should be a quick exercise.

So what Fermi immediately realized was that the aliens have had more than enough time to pepper the Galaxy with their presence. But looking around, he did not see any clear indication that they are out and about. This prompted Fermi to ask what was (to him) an obvious question: "where is everybody?"

This sounds a bit silly at first. The fact that aliens do not seem to be walking our planet apparently implies that there are no extraterrestrials anywhere among the vast tracts of the Galaxy. Many researchers consider this to be a radical conclusion to draw from such a simple observation. Surely, there is a straightforward explanation for what has become known as the Fermi Paradox. There must be some way to account for our apparent loneliness in a galaxy that we assume is filled with other clever beings.

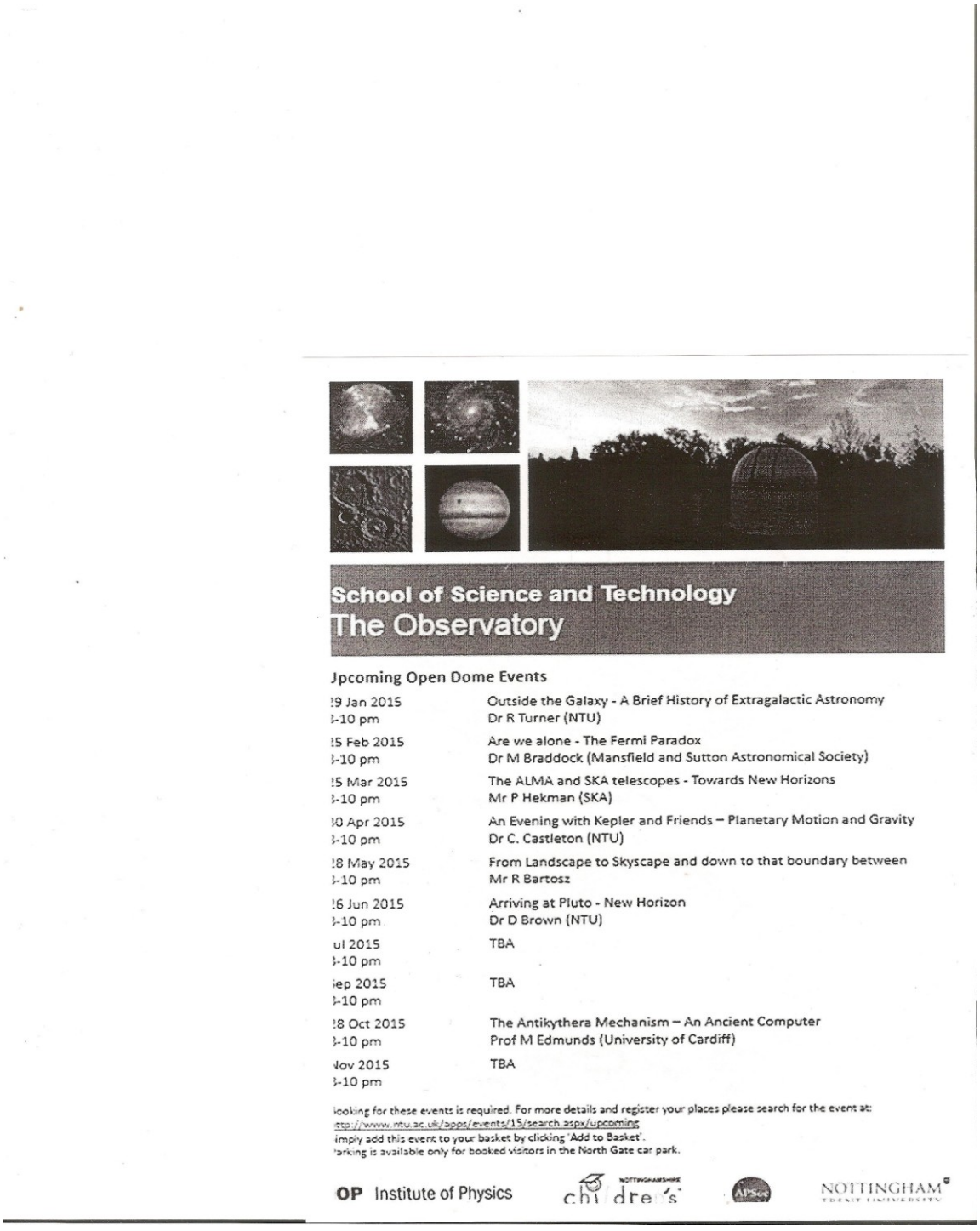
A lot of folks have given this thought. The first thing they note is that the Fermi Paradox is a remarkably strong argument. You can quibble about the speed of alien spacecraft, and whether they can move at 1 percent of the speed of light or 10 percent of the speed of light. It doesn't matter. You can argue about how long it would take for a new star colony to spawn colonies of its own. It still doesn't matter. Any halfway reasonable assumption about how fast colonization could take place still ends up with time scales that are profoundly shorter than the age of the Galaxy. It is like having a heated discussion about whether Spanish ships of the 16th century could heave along at two knots or twenty. Either way they could speedily colonize the Americas.

Consequently, scientists in and out of the SETI community have conjured up other arguments to deal with the conflict between the idea that aliens should be everywhere and our failure (so far) to find them. In the 1980s, dozens of papers were published to address the Fermi Paradox. They considered technical and sociological arguments for why the aliens were not hanging out nearby. Some even insisted that there was no paradox at all: the reason we don't see evidence of extraterrestrials is because there aren't any.

Four of our number were brave enough to have their photograph taken (see photo).

All-in-All a most thought provoking and stimulating evening.

Afterward the presentation we were given a guided tour of the observatory and received a program of upcoming Open Dome Events.
(see below).



School of Science and Technology
The Observatory

Upcoming Open Dome Events

19 Jan 2015 8-10 pm	Outside the Galaxy - A Brief History of Extragalactic Astronomy Dr R Turner (NTU)
15 Feb 2015 8-10 pm	Are we alone - The Fermi Paradox Dr M Braddock (Mansfield and Sutton Astronomical Society)
15 Mar 2015 8-10 pm	The ALMA and SKA telescopes - Towards New Horizons Mr P Hekman (SKA)
10 Apr 2015 8-10 pm	An Evening with Kepler and Friends – Planetary Motion and Gravity Dr C. Castleton (NTU)
18 May 2015 8-10 pm	From Landscape to Skyscape and down to that boundary between Mr R Bartosz
16 Jun 2015 8-10 pm	Arriving at Pluto - New Horizon Dr D Brown (NTU)
ul 2015 8-10 pm	TBA
iep 2015 8-10 pm	TBA
18 Oct 2015 8-10 pm	The Antikythera Mechanism – An Ancient Computer Prof M Edmunds (University of Cardiff)
lov 2015 8-10 pm	TBA

ooking for these events is required. For more details and register your places please search for the event at:
ttp://www.ntu.ac.uk/apps/events/15/search.aspx/upcoming
imply add this event to your basket by clicking 'Add to Basket'.
arking is available only for booked visitors in the North Gate car park.

OP Institute of Physics