

# Institute of Physics – L & S E Branch

## Retired Members Section

RECENT AND FUTURE DEVELOPMENTS IN ASTRONOMY  
ROYAL ASTRONOMICAL SOCIETY, BURLINGTON HOUSE  
THURSDAY 7 JULY 2016

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This meeting has been organised by Stewart Coulter

Chair: Mike Quinton

### PROGRAMME

10:00 Registration and coffee

10:30 Welcome and notices

10:40 Prof Mike Cruise: Gravitational Waves (detected 11 Feb 2016)

11:30 Dr Steve Fossey: Our local supernova (discovered ULO Jan 2014)

12:15 Dr Michelle Lochner: The Square Kilometre Array and Big Data

13:15 Buffet lunch in the Council Room

14:15 Prof Giovanna Tinetti: Exoplanets: the search for habitability

15:05 Dr Louise Alexander: What the Apollo samples continue to teach us

16:00 Prof Chris Lintott: Title reserved for late developments

17:00 Tea/coffee

17:30 Vacate

Venue: Royal Astronomical Society Lecture Theatre, Burlington House, Piccadilly.  
Registration, refreshments and lunch in Council Room on 2<sup>nd</sup> floor. There is a lift.

Costs: Free but £17 with buffet lunch (for the first 50).

This is a London & SE Branch meeting and is open to visitors and the public free of charge. Please register on the London and SE website:

[http://www.iop.org/activity/branches/south\\_east/lse/](http://www.iop.org/activity/branches/south_east/lse/)

For lunch please register on the REMS/IOP website [www.london.iop.org/remes](http://www.london.iop.org/remes) which takes you to the REMS page and click on the calendar link on the left.

## SPEAKERS

**Prof Mike Cruise (Birmingham)** Since the publication of Einstein's theory of Gravity (General Relativity) in 1915 scientists have been struggling to detect the very weak gravitational waves predicted to come from interactions of Black Holes and other exotic objects. After several decades of detector development the first direct detection was announced by the advanced LIGO project in February this year, opening a new window on the universe. This detector is the most sensitive interferometer ever built, able to detect movements less than a thousandth of an atomic nucleus in size. Mike Cruise has been working as part of the teams seeking to detect these waves since the 1980s and the group at Birmingham was closely involved in the recent detection. He is also working on a space based detector to search for signals from supermassive Black Holes which lurk at the centre of galaxies.

**Dr Steve Fossey (ULO)** and his students made the news in Jan 2014 when an unexpected discovery turned an ordinary teaching session into an extraordinary one. The discovery was of a type-Ia supernova (SN) in the galaxy Messier 82, one of the closest SN in recent decades. Dr Fossey recounts the exciting story of the serendipitous discovery, the race to report and how it was strangely missed by professional surveys and amateur observers. Also how this event has provided fresh insight into the origin and nature of these cosmologically significant events.

**Dr Michelle Lochner (UCL)** is a cosmologist with a special interest in radio astronomy. She describes what the Square Kilometre Array, to be built shortly in Australia and S Africa, promises to reveal to us once it is brought on-line in 2020. The amount of data it will produce will surpass current internet traffic. Michelle will go on to discuss the issue of Big Data, how to cope with such enormous amounts of information, not just here but in other fields where volume is such an issue.

**Prof Giovanna Tinetti (UCL)** no field in astronomy has changed nor established itself quite as much in the last 21 years as exo-planet research. From the first discovery in 1995 to the thousands known today, the rate of discovery is increasing and will continue to do so as new surveys are conducted and missions launched. Prof Tinetti is lead scientist for the Twinkle Mission slated for launch in 2019 which will take spectra of exo-planet atmospheres for the first time as they transit their parent star. This is a particularly exciting development since it will reveal the composition of their atmospheres, weather plus much more besides.

**Dr Louise Alexander (Birkbeck, University of London)** completed her PhD analysing Apollo 12 lunar basalt samples only last year. Louise will recount how lunar regolith samples have given us a good though incomplete theory for the formation of the moon, an understanding of the composition of the lunar crust and mantle and of the history of lunar volcanism. Her current research involves unravelling the fossilised record of the solar system's passage through the galaxy which may be revealed through the study of cosmogenic nuclei contained in lunar meteorites and Apollo samples. <http://lunarexploration.esa.int/#/explore/science/223>

**Prof Chris Lintott (Oxon)** is well known as presenter of BBC's Sky at Night and for leading the crowd-sourcing Galaxy Zoo project – another approach to Big Data. Chris's title is reserved in case of late developments.