Conference “Astronomy. From here, to eternity?”

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Speaker: Edmund Leary (edmund.leary@imdea.org)

Curriculum vitae

Edmund Leary received his PhD in Chemistry from the University of Liverpool, UK, in 2008, where he also obtained his Masters’ degree in Chemistry in 2004. In 2009 he began working at the Instituto Madrileño de Estudios Avanzados (IMDEA) Nanociencia Foundation - a joint initiative of the regional Government of Madrid and the Ministry of Science and Education of the Government of Spain. His research interests lie in the field of Molecular Electronics, and in particular studying how single molecules conduct electricity. He has 14 publications to his name so far and has presented his work at several major international conferences.

Dr. Leary has publications in both chemistry and physics specific journals. Specific examples are: “Single-Molecule Solvation-Shell Sensing”. Leary, E; Hobenreich, H; Higgins, SJ, et al. PHYSICAL REVIEW LETTERS, Volume: 102 Issue: 8 Article Number: 086801 Published: 2009, and “Chemical control of double barrier tunnelling in alpha, omega-dithiaalkane molecular wires”. Leary, E; Higgins, SJ; van Zalinge, H, et al. CHEMICAL COMMUNICATIONS, Pages: 3939-3941 Published: 2007.

He has presented orally his work at several international conferences including the European Conference on Surface Science in Liverpool, UK, in 2008 and the Electrochemical Society’s annual meeting in Vacouver, Canada in 2010. He is currently part of a European network called ELFOS which is investigating the use of molecules as tiny magnets. In his spare time he enjoys cycling and astronomy.

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Dr. Edmund Leary

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Astronomy is, perhaps, the oldest science. People have been observing the heavens for many thousands of years, and making predictions based on those observations. In the beginning this was mainly for religious purposes. Modern astronomy really began during the Renaissance with the observations of Galileo, Copernicus and Kepler, whilst Isaac Newton explained the motion of the heavenly bodies, gave a theory of gravity, and invented the reflecting telescope! Arguably the most important discovery in modern astronomy is what is known as the Cosmic Microwave Background. This is radiation (of the kind which we all use in the kitchen!) which is all around us and provides the strongest evidence we have for the Big Bang, the proposed origin of the Universe. Several other recent discoveries now go to show how little in fact we know about the Universe. These include Dark Matter and Dark Energy. Dark Matter is 'dark', because we cannot 'see' it. In other words it does not interact with radiation, we can only detect it via its gravitational influence on visible matter. Dark Energy is so called because we have virtually no idea what it is! But since 1998, astronomers have known that something is opposing gravity and actually speeding up the rate of expansion of the entire universe.

Nowadays, Astronomy is intimately linked with the subjects of Cosmology and Particle Physics to try and answer the big questions posed by these baffling observations. Two of the biggest are perhaps 'What came before the Big Bang?' and 'Is the Universe infinite, or does it have an edge?' My talk will begin with a look at how anyone can get started in astronomy, from the type of equipment available to the modern day amateur, through to some important observations that can be made which can help professional astronomers. In the second part of my talk I shall take a look at recent progress in our understanding of the Universe, which leads to fascinating ideas such as if the Universe is infinite, then there is really somebody who looks just like you, reading the same advert for the same lecture, somewhere else in the Universe right now! However, if the Universe is finite, what lies beyond? Neither scenario makes any real sense!

Vocabulary

Astronomy	Star	Big Bang
Cosmology	Galaxy	Dark Matter
Telescope	Black Hole	Dark Energy
Moon	Quasar	Standard Candle
Planet	Universe	Radio Astronomy

Recommended Reading

- "Phillips Practical Astronomy"*****. ISBN-10: 0540089990. Philip's (6 Nov 2006)
- "Phillips Stargazing 2013". ISBN-10: 1849072353. Australian Consolidated Press (ACP), 2012
- "Patrick Moore's Yearbook of Astronomy 2013". Partick Moore. Macmillan (22 Nov 2012)
- "Astronomy Manual: The Practical Guide to the Night Sky". Brian May, Jane A. Green and Patrick Moore (7 Oct 2010)
- "Cosmos". Carl Sagan. ISBN-10: 0349107033. Abacus; New Ed edition (11 Aug 1983)
- "A Brief History Of Time: From Big Bang To Black Holes". Stephen Hawking. Bantam (18 Aug 2011)

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