

Astrobiology and Science Communication: The Search for Life beyond Earth

Indian Institute of Science Education and Research Kolkata (IISER K)

DATES: July 22 – July 26

TIME: 10 AM to 12 noon (Astrobiology) and 2 PM to 4 PM (Science Communication)

Venue: Ashima Chatterjee Auditorium, TRC 2nd Floor, IISER Kolkata

REGISTER AT <http://www.gian.iitkgp.ac.in/GREGN/index>

The Faculty



Prof. Lewis Dartnell (www.lewisdartnell.com) is an internationally-recognised Astrobiology researcher and science communicator and Professor at the University of Westminster, UK. Prof. Dartnell's research focuses on how hardy microbial life, and signs of its existence, might survive the intense cosmic radiation on the surface of Mars. His work is deeply connected to the European Space Agency's next-generation Mars rover, ExoMars, which will launch in 2020 specifically to look for signs of past or present microbial life in the Martian surface. Prof. Dartnell is a prolific science communicator, writing numerous science articles in newspapers and magazines (including The Guardian, New York Times, and New Scientist), and is regularly interviewed on radio and TV news about science and technology. He provides consultation for many TV documentaries and film producers and has appeared in BBC shows, National Geographic, Discovery and History channels. He has published several successful popular science books, including 'The Knowledge: How to Rebuild our World from Scratch' (www.the-knowledge.org), an international best-seller.

Lecture Schedule

Morning (10 AM – 12 noon) Astrobiology	Afternoon (2 PM to 4 PM) Science Communication
<p>Life <i>Before we can begin hunting for signs of biology beyond the Earth, we need to understand what 'Life' is in the first place. What defines life, how did it emerge on the young Earth, and what are the hardiest living organisms on the planet that inform us on the possibility of extraterrestrial life?</i></p> <p>L1. Defining life, its origins, and detectable biosignatures</p> <p>L2. Extremophiles and the survival limits of terrestrial life</p>	<p>Foundations</p> <p>L1. The Fundamentals of Clear Communication What is the value of science-communication, both for the general public and as a key transferable skill, and what forms does it take?</p> <p>W1. Elevator pitches How to explain the background field and details of your work clearly and concisely; perfect for meeting new colleagues at conferences.</p>
<p>Cosmic Requirements <i>Life requires a particular set of cosmic conditions in order to develop. What vital role do astrophysical events play and how has the Earth provided a habitable environment for billions of years?</i></p> <p>L3. Astrophysical conditions & origins of the solar system</p> <p>L4. What makes Earth a habitable planet?</p>	<p>Understanding your audience</p> <p>L2. Hitting the mark How to pitch your writing or talks at the right level for your particular audience. The use of appropriate language, and how to increase its potency with metaphors, analogies and human stories.</p> <p>W2. How to plan and structure Practical exercise on techniques for organising your thoughts, structuring your talk or article logically, and how to beat writers' block.</p>
<p>Mars: Our Neighbouring World <i>The red planet is considered by many to offer the best hope for extraterrestrial life in our solar system. What have we learned about the ancient Martian environment and the extent of liquid water, and how are we searching for 'biosignatures' of Martian life now?</i></p> <p>L5. Martian planetary history: a habitable world?</p> <p>L6. Our robotic search for signs of Martian life</p>	<p>Tools for effective presentations</p> <p>L3. Powerpoint and demonstrations How to construct a clear and visually-engaging presentation. How to use Powerpoint slides most effectively, and what pitfalls to avoid. The effective use of practical explanations and demonstrations.</p> <p>W3. Public speaking How to prepare for your talk. Techniques and tricks for memorising what you want to say. How to handle nerves before/during your performance.</p>
<p>A Teeming Solar System <i>Beyond Mars, there are several other worlds that could potentially harbour life in our solar system. We'll take a guided tour of Europa, Venus, Titan, and Enceladus to have a look at the evidence for habitable environments, and discuss the pros and cons of living on each.</i></p> <p>L7. Ice Worlds: Europa and Enceladus</p> <p>L8. Venus and Titan: a different kind of life?</p>	<p>How science hits the headlines</p> <p>L4. Science journalism What is the process behind discoveries in the lab becoming reported in news stories consumed by the general public? The key elements of good science writing, and how to structure your pieces.</p> <p>W4. Popular science writing. Practical exercise on translating a primary research paper into a press release or newspaper/magazine article suitable for the general public.</p>

<p>Exoplanets - Life by the light of other suns <i>In just the last 20 years we've discovered over 3,500 exoplanets; other worlds orbiting distant suns in our galaxy. These exoplanets show greater diversity than ever imagined, and some are even potentially habitable.</i></p> <p>L9. Detection: How to discover new worlds</p> <p>L10. Characterisation: Planetary environments and remote biosignatures</p>	<p>New Avenues for Communication</p> <p>L5. Social Media, Podcasts and YouTube We'll explore these new opportunities, their strengths and weaknesses, and how to use them in the most effective way possible.</p> <p>W5: Exploring examples Participants will gather examples of different science YouTube videos and social media streams, and combine them with particular examples pre-selected by the lecturer. Group discussion on the different approaches and styles represented, and drawing lessons from what works well.</p>
<p>TOTAL: 15x one-hour lectures, 5x one-hour workshops</p>	

<p>You Should Attend If...</p>	<p>This course is designed to bring together students and researchers in the fields of Earth Sciences, Biology, Physics and the Space Sciences to raise awareness of new directions in the field of Astrobiology in India, combined with a practical course in science communication skills. The training in science communication does not require expertise or research interests in Astrobiology.</p> <p>The lectures in Astrobiology will discuss not only the latest discoveries at the cutting edge of this fast-moving field of research, but also the key methodologies and analytical techniques employed.</p> <p>The course will deliver training on clear and effective science communication, which is a key transferable skill, and enormously beneficial to the careers of the individuals involved. Improved structuring, language and writing skills are valuable for improving the construction of research papers and other academic output, as well as persuasive research proposals with a much higher chance of being successfully awarded funding. Engaging and confident public speaking is also vital for delivering national and international conference presentations and seminars. This practical training is designed to empower the participants to disseminate the importance of science beyond the academic community and to stimulate public engagement with the science in India.</p> <p>This course will be of interest if:</p> <ul style="list-style-type: none"> ▪ You are a student or researcher in the fields of Earth Sciences, Biology, Physics or the Space Sciences interested in learning about new directions in the field of Astrobiology in India. Scientists, researchers and teachers from colleges, research institutes and universities across India as well as undergraduate and graduate students are welcome. ▪ You are interested in honing your science communication skills so that you are able to disseminate the importance of your research beyond the academic community and to stimulate public engagement with science. This training in science communication does not require expertise or research interests in Astrobiology.
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