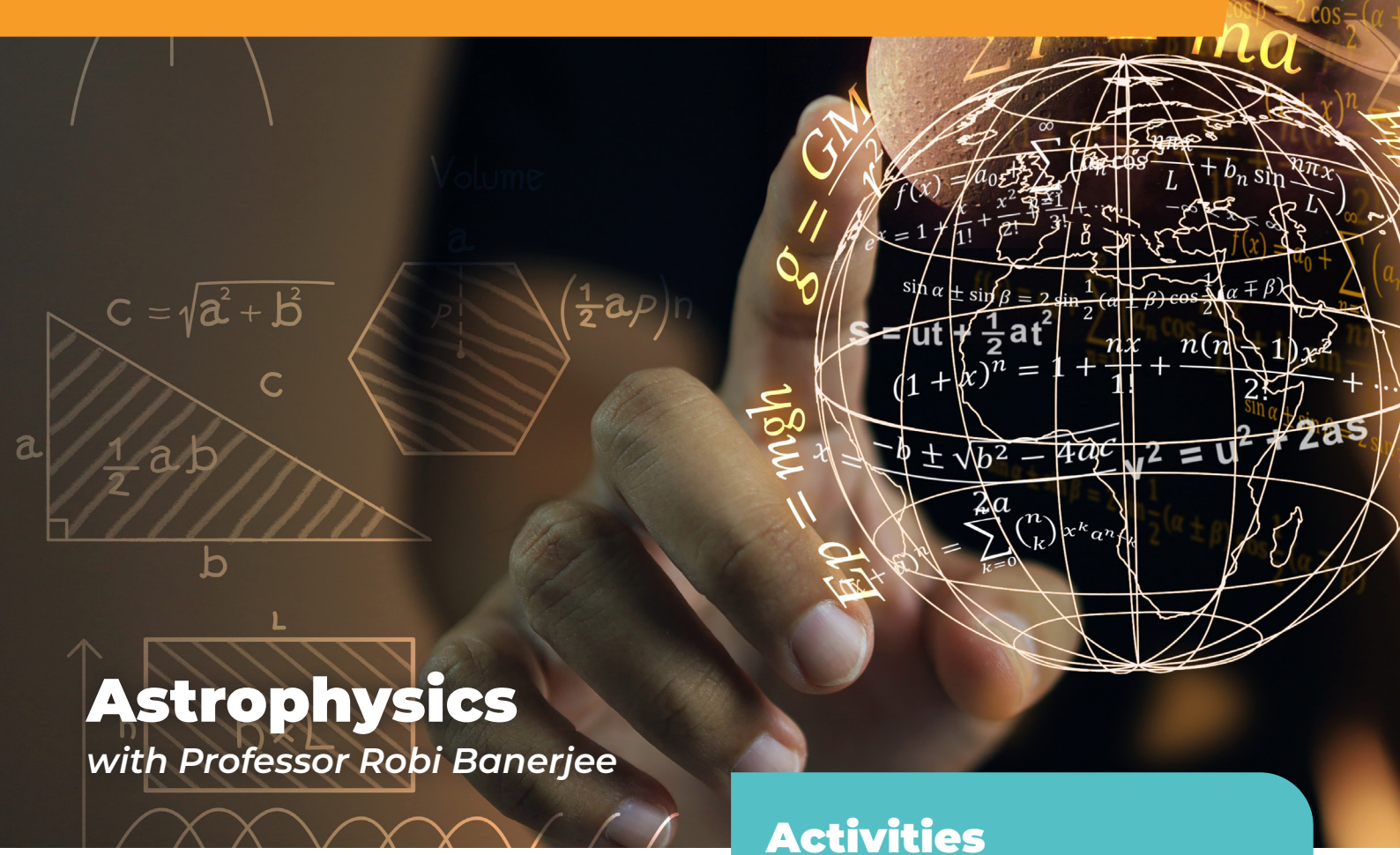


Astrophysics

with Professor Robi Banerjee

Talking *points*

Knowledge

1. In physics, what is a constant?
2. According to Robi, what are the fundamental constants and dimensions?
3. What is the fine-structure constant?

Comprehension

4. Why did Robi think one of the fundamental constants was redundant?
5. How did Robi determine which fundamental constant could not be combined with the others?

Analysis

6. Why do you think Robi says life as we know it would not exist if the fine-structure constant was not ~1/137?
7. Why do you think mathematics is described as 'the language of nature'?

Evaluation

8. Why do you think it is important that physicists explore questions about the Universe that might not have obvious and immediate applications?
9. To what extent are you curious? What aspects of nature and the Universe do you have questions about? And how do you think physics could help you explore these questions?

Activities

Robi is passionate about the mysteries and miracles of the Universe. These topics are often highly complex, so explaining them in simple language is a key skill to ensure that everyone can appreciate the marvels of nature.

Choose a topic in physics, such as Newton's laws of motion, gravity or the speed of light.

Design an engaging way to introduce your chosen topic to 11-to-14-year-olds and ignite their curiosity about physics. For example, you could create a comic strip, perform a play or plan an interactive lesson. Be creative!

How will you ensure your resource or activity is appropriate for your target audience? How will you explain complex physics concepts in a clear and understandable way? For example, what analogies could you use to relate aspects of the topic to everyday ideas that younger students will understand? How will your resource or activity inspire 11-to-14-year-olds to get excited about physics?

More *resources*

- This video introduces the fine-structure constant in 60 seconds: youtube.com/shorts/9pebuHH4epg
- The Harvard and Smithsonian Center for Astrophysics provides educational resources for students and teachers: cfa.harvard.edu/resources/educators-and-students