BACK TO BASICS: PROBING UNIVERSITY STUDENTS' FOUNDATIONAL KNOWLEDGE OF ASTRONOMICAL ANATOMY

Samuel Wait[a], James Thomas[b], Vinesh Maguire-Rajpaul[c], Christine Lindstrøm[a]

Presenting Author: Samuel Wait (s.wait@unsw.edu.au)
[a]School of Physics, University of New South Wales, Sydney NSW 2052, Australia
[b]Department of Physics and Astronomy, University of New Mexico, Albuquerque NM 87131-0001, USA
[c]Astrophysics Group, Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK

KEYWORDS: physics education research, astronomy education, misconceptions, undergraduate learning and teaching

There is an enduring problem in astronomy education of students knowing far less than lecturers expect about the nature of astronomical objects. In previous work of ours, using the Introductory Astronomy Questionnaire (IAQ), we have looked at students' knowledge of relative scale of astronomical objects—essentially what is bigger or further away than something else. We have previously identified, for example, that among 922 Norwegian middle school students, 41% believed planets were bigger than stars, and for 211 undergraduate students at the University of New Mexico, 29% of students had the same misconception before commencing an introductory astronomy course. To explore the origins of these misconceptions, we also asked students at the University of New Mexico to provide basic definitions of a planet, star, galaxy, universe and solar system. Responses were coded for categories informed by object definitions as used by astrophysicists, such as knowing that planets orbit stars. In this presentation, I will discuss our coding, analysis and results. For example, only 30% of students identified that planets orbit a star in their definition of planets before taking the course. This research has elucidated that basic knowledge of astronomical anatomy cannot be assumed of students entering the tertiary education sector.

Proceedings of the Australian Conference on Science and Mathematics Education, 30 September - 2 October 2020, page 84, ISBN Number 978-0-9871834-9-1.