

## Discussion Guide

### *The Crowd and the Cosmos: Adventures in the Zooniverse* by Chris Lintott



1. What did you think scientific research looked like before reading this book? How did Lintott change or reinforce your perspective?
2. What are the advantages and drawbacks to open information in scientific research? Who do they impact?
3. Lintott describes three categories of scientists – the theoretician, the experimenter and the computational scientist - in his discussion of why people struggle with scientific debates like climate change. What do you think of this framework? How does it affect your thinking about science and complex theories?
4. How does the development of “big data” – larger and larger sets of observations from increasingly complex research – affect the way scientific research is conducted? What do the web and mobile technologies lend to scientific research?
5. What can we learn from early citizen science efforts, both the successful and unsuccessful ones? What does Charles Darwin’s practice in later life of corresponding with nature observers throughout the world teach us about good citizen science?
6. Which story of a citizen science discovery is your favorite and why?
7. Lintott describes four kinds of volunteers: those who are nearly always right, those who are always wrong, optimists who tend to see positive results but can be reliable when they report negative results, and pessimists who tend to see negative results but are accurate when they identify a positive one. How does Zooniverse find a way to get useful data from all four of them? How do you feel about the measures that Zooniverse puts in place to guard against human fallibility?
8. What advantages and drawbacks does the citizen scientist have as compared to the expert researcher? How does the citizen scientist compare to machine learning?
9. To what degree does citizen science rely on exciting the imagination? What do you think of Lintott’s concern that gamifying the citizen science experience too much will eliminate the sense of discovery? Why is it important that citizen science address real-life research needs rather than focus solely on interesting things to learn about?
10. Lintott focuses mainly on astrophysics in his discussion. In what other fields can citizen science be used? In what situations do you think it cannot be used?

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