

THE COSMIC CAST: PROGRESS UPDATE AND ADAPTATION TO A REMOTELY PRODUCED PODCAST T. A. Harvey¹, M. Lo¹, E. J. Carter², R. Bahia³, and J. F. Pernet-Fisher¹. ¹Department of Earth and Environmental Sciences, University of Manchester, M13 9PL, UK, ²Department of Geology, Museum Building, Trinity College Dublin, Ireland, ³European Space Agency, European Space Research and Technology Centre, Noordwijk, Netherlands, (thomas.harvey-2@manchester.ac.uk).

Introduction: *The Cosmic Cast* is an Earth and planetary science podcast, run by members of the Earth and Solar System outreach team at the University of Manchester [1-3]. We use our platform to share publicly funded science, supplementing in-person outreach activities organized by our group.

The primary advantage of podcasts is that they are an accessible medium for large global audiences to engage with science content. Indeed, there has been an exponential growth of science podcasts between 2010 and 2018, 77% of which target public audiences [4]. By their nature, podcasts are unconstrained by demographic or geographical restrictions and are able to develop a far-reaching and diverse listenership. Of 952 active podcasts surveyed by [4] in 2019, 68% are described as ‘general science’, physics-focused, or biology-focused. Earth and planetary sciences only made up 2% of active podcasts, with chemistry making up 3%. Despite these low proportions, the ongoing growth indicates that there is a continuous demand for Earth and planetary science content, and that podcasting is effective at delivering it.

Here, we discuss the effectiveness of adaptations to our approach made since our last summary, and we provide an update on the growth of the podcast, highlighting the effectiveness of the podcast as a tool for sharing scientific research.

Approach: Since February 2019, we have produced 94 episodes aimed at a target audience of high school or older educated members of the public who are interested in science. YouTube has been the primary host for *The Cosmic Cast* [4], although it is also available from several other media platforms such as Apple Podcasts (developed by Apple Inc.), and Spotify (developed by Spotify Technology S.A.). The unique advantage of publishing content with YouTube is the ability for the audience to leave feedback or ask questions on individual episodes as a mechanism for engaging with our audience.

Key drivers of audience enjoyment and podcast longevity are based around creator-audience engagements [5]. We have made use of our research group’s outreach framework using Twitter, Facebook and Instagram pages to publicize episodes and to solicit engagement for our regular ‘Q&A’ episodes.

Based on data collected in 2009, the average person spends ~30 minutes listening to individual podcasts [6]. As such, we aim to keep each episode around 30 – 45 minutes in length, in order to maximize listener retention. More formal styles of programming historically associated with science content (e.g., BBC Radio 4 (UK); National Public Radio (USA)) tend to have an older average listener age of 56 and 55 respectively [7,8], whereas in 2019 59% of podcast listeners were under 35 [9]. In this regard, by keeping episodes conversational in style, we hope to attract the widest range of potential listener demographics.

To date, episode topics have spanned a wide range of themes, reflecting the diverse research interests of the Earth Sciences department at the University of Manchester, and of the wider Earth and planetary science research community. We encourage faculty members to discuss interesting field work or newly published papers; topics range from meteorite hunting in Antarctica [10] to lunar in-situ resource utilization [11]. Since the outset of the podcast, we have encouraged researchers visiting the department to use the podcast as a platform to talk about their work.

In addition to science content, we ask guests to talk about their career paths. We feel that it is also important to talk about the challenges associated with an academic career. Indeed, transparency when discussing this topic is critical for improving the perception of academic research as an accessible career path.

Remote podcasting: With the widespread shift to online working in 2020, we modified our approach to keep producing podcast content using Zoom [12]. Zoom is an online conference software that has allowed us to widen our potential pool of guests to a range of institutions all over the world. Since our transition to Zoom, we have also shifted to publishing episodes on YouTube with the accompanying video recording, which we feel enables our audience to better connect with the hosts and our guests. Recording of video content in this manner also allowed guests to share relevant data or images using the screen sharing function, which is much more straightforward than editing these in post-production. Since 2020, our transition to Zoom and an effective promotion of episodes was a key driver for the growth of our podcast. This is evidenced by high view counts for episodes that

guest's shared using their own social media accounts. By engaging with researchers from an even broader range of institutions, episodes of *The Cosmic Cast* were consequentially promoted to more diverse audiences, contributing to growth.

The result of the shift to remote podcasting was that we were able to keep producing the episodes despite local lockdown restrictions. We were able to expand on the range of topics that we could cover by increasing the number of guests that were accessible to be guests, which has been a well-received change. As some restrictions on working in office spaces are lifted, we will be able to record in-person episodes again, but it is likely that online recordings will continue to form an important component of our content.

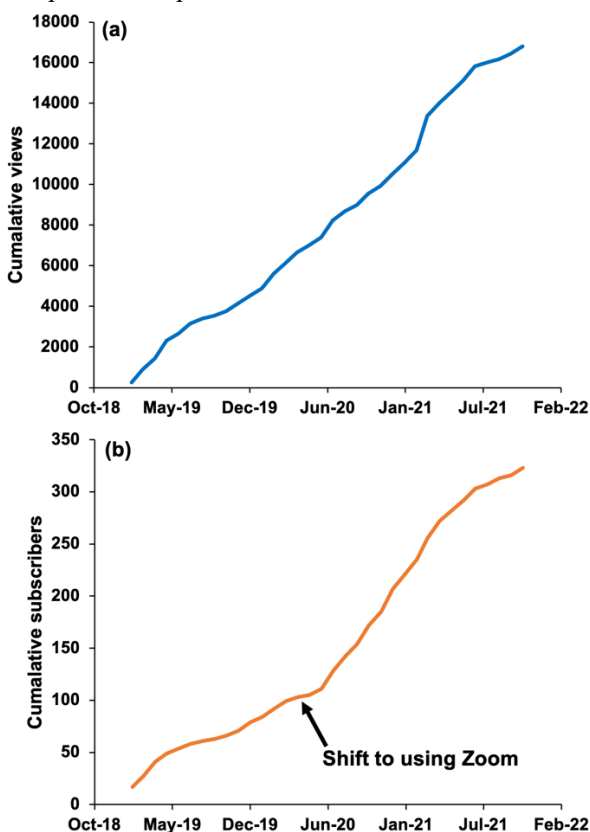


Figure 1: YouTube analytics data for (a) cumulative channel views, and (b) cumulative subscriber count for *The Cosmic Cast* since 2019.

Impact: In three years of podcast production, we have amassed 17,145 views on YouTube, equivalent to a total time listened of 1440 hours. This is a disproportionate return on the recording time invested in the production of these episodes. Additionally, our subscriber count has grown from 80 to 341 since our last summary [1]. Our geographical reach has also expanded, and since the start of the second season (in Fall

2019), episodes of *The Cosmic Cast* uploaded to the YouTube channel have engaged listeners from countries as diverse as Australia, Denmark and Ukraine.

Although our community of subscribers has steadily grown, the proportion of views by non-subscribers has grown to ~70 % indicating that YouTube's content algorithms are effective at sharing the podcast. Figure 1a shows that podcast episode views have continued to grow at a steady rate, while Figure 1b illustrates the growth in subscribers count over the past three years. Slight deviations in the growth trend coincide with seasonal breaks in production that likely explain a temporary lull in engagement. Anecdotally, it is commonly remarked that growth on media platforms such as YouTube is maintained in part by constant content production. Notably, there is a marked uptick in cumulative subscribers around April–June 2020, which coincides with our shift to recording episodes via Zoom, increasing the reach of our channel. This may have been a result of individuals shifting to working from home, causing people to search for accessible content.

Summary: *The Cosmic Cast* metrics shown above indicate that engagement with Earth and planetary science content is ongoing and there is growing support for scientific research to be shared in an accessible format. Since our last summary, *The Cosmic Cast* has provided thousands of hours of outreach-level engagement to a global audience, and has continued to reach a diverse audience, proving that is an effective outreach tool on an ongoing basis.

Although we had to modify our approach to recording episodes, our new format has proven to be more effective for producing Earth and planetary science content. Indeed, we have been able expand our reach, and will continue to look for ways to improve the quality and accessibility of our content.

References: [1] Pernet-Fisher J.F. et al. (2020) *51st LPSC*, 1378. [2] tinyurl.com/cosmiccast [3] earthandsolarsystem.wordpress.com [4] MacKenzie L.E. (2019) *Royal Society Open Science*, 6, 180932. [5] Markman, K. (2012) *New Media & Society*, 14, 547-565. [6] bridgeratings.com/press.04.01.10.DeviceUsage [7] downloads.bbc.co.uk/radio/commissioning/R4_44Minute_Drama_Audience_Pack.pdf [8] npr.org/sections/gofigure/2010/04/05/125578017/median-ages-across-npr-platforms [9] edisonresearch.com/infinite-dial-2019/ [10] Evatt G. et al. (2016) *Nat Comms*, 7, 10679. [11] Just G. et al. (2020) *PSS*, 104746. [12] zoom.us