Public Engagement Fund

science that these huge collaborations are made up of people, and it is possible to get involved if you want to.

7. Is the purpose of your activity to consult and listen to public views?
No

8. Is the purpose of your activity to collaborate with the public?
No

9. Why do you want to engage with the public? What do you hope to achieve by engaging?
Astronomy research represents a significant monetary expense, for example JWST is set to cost around $10billion. This expense is largely shouldered by the governments of the countries involved and therefore ultimately by the taxpayer. Justifying to the public why this money should be spent on pure research rather than either applied research eg. Medical research, or more immediately beneficial sectors eg. housing, seems fair when they are ultimately footing the bill. I therefore hope to impress two major points onto the general public with this project.

Firstly, astronomy is often described as a hook: children are naturally interested in space and this can be leveraged to get them interested in other Science, Technology, Engineering and Maths (STEM) subjects. Preserving the excitement for astronomy already present in younger children into their teen years can have large impacts in the numbers of students choosing STEM subjects when they reach higher education. Many students of high-school age complain that their science and mathematics and education lacks context or real-world application. Public engagement is an ideal theatre to provide this context - real scientists, engineers and mathematicians showing them how the maths and science the students are learning in the classroom is applied to do amazing things. Interacting with real scientists and doing outreach activities can let children know that even if they aren't the top students in their class, they can absolutely contribute to science, but they have to choose to stick with it.

Secondly, pure research provides a bedrock upon which applied science is built. Many of the revolutionising technologies of the past 100 years started out as a solution to a pure research problem. Just a few examples of this include PET scanners (particle physics), CCD's – which are the microchips analogous to film in all digital cameras (astronomy), or the invention of Nylon. However, the link between the pure research, and these technologies becoming widely used can be subtle, largely because it can take many years or decades between discovery and a consumer product using them. Astronomy research today will undoubtedly lead to exciting new consumer technology, however exactly what that will be is not a question that can be answered a priori.

10. What are the objectives of the activity? Please list the steps you will take to achieve these objectives.
The activity aims to:

Build an activity simulating what it is like to search for distant galaxies with a telescope. This activity will feature a modified webcam mounted inside a telescope which will be used to search for "galaxies" made from clusters of LEDs.

Take this activity to the Royal Society summer science festival in early July, followed by incorporating it into the University's Mathematical and Physical Sciences (MPS) existing outreach program as an activity taken to local schools and other large events.

Publish the plans to build the device online on the MPS outreach web-page. This project will require a solid understanding of the physics behind telescopes, engineering and computer programming so would be a perfect extended project for groups of students (eg. school technology clubs) with the right funding either in part (eg. just using a raspberry Pi to broadcast what a camera is seeing) or as a whole. These plans would

also be specifically shared with the University's partners within the South-East Physics NETwork (SEPNET) and at a wider meeting of the Institute of Physics outreach and public engagement network.

11. How will you evaluate whether you have achieved the objectives of the activity?
At the Royal Society summer science exhibition, we intend on gathering feedback by two methods. Our

to the extreme, searching for the reddest, and therefore the most distant and the oldest galaxies. These galaxies being so distant that we are looking at them as they were billions of years ago, looking back to when the Universe was much younger than it is today.

The James Webb Space Telescope is an infrared telescope, designed in part to peer billions of years back into the Universe's history to try to describe how it was different than it is today. It promises to be the most important leap forward in high-redshift astronomy in almost 30 years – since the Hubble Space Telescope's launch in 1990. Many astronomers – myself included – are working to develop tools so that as soon as the telescope is ready to observe, we are ready to analyse and interpret what JWST sees.

The project will benefit me directly because conducting public engagement activities provides me with experience explaining my research to people who aren't experts in astronomy. This experience will prove valuable when writing grant proposals, which are often reviewed by scientists who specialise in other areas. If I am able to communicate my research to the public in a concise and accessible way, the experience should prove invaluable for communicating it to a scientifically literate panel.

15. What is the potential legacy of the project?
The legacy of this project will be in two parts. Firstly, the physical materials produced: the model telescope will continue to see use in schools around the south-east of England through the MPS outreach programme, and other large events with which the university is already involved. The plans for the project being publish online will hopefully lead to other institutions or keen school groups such as astronomy clubs attempting to replicate the build, learning about the instrumentation side of astronomy, computer programming and engineering challenges in the process.

Secondly, the legacy of this project will be a public understanding of what JWST is hoping to achieve, and that even though it is a NASA led project, members of their local communities are actively involved in producing science from this amazing project.

16. Please outline your public engagement experience to date
During my undergraduate degree at Sussex I worked under casual employment for 5 years for Dr [redacted]s a physics and maths outreach demonstrator. This involved taking educational activities into schools, to festivals and other large events in order to engage children with physics, maths and astronomy. I averaged around 100 teaching hours per year. During this time I was involved with the development of

Telescope and mount (donated by MPS school)	£0.00
Consumer Webcam	£50.00
Raspberry Pi	£35.00
Screen/tablet for viewing	£100.00
Optical and IR filters	£50.00
Mounting equipment and paint	£100.00
MPS workshop labour (8-10 hours)	£250.00
Travel to the Royal Society	£30.00
Collapsible promotional Banner, feedback cards.	£135.00

Total: £750.00

Total requested from the Public Engagement Fund
£750.00

18. Budget code
Code to be created upon successful application

19. Supporting statement

Please submit a supporting statement (in PDF format) from your supervisor (for doctoral researchers) or the relevant Principal Investigator (for research staff).

The supervisor/PI's name, title and electronic signature should also be included in the statement you submit.

If you have