

SPACE TWINKLES: WHY DO WE GO IN THE SPACE? A. Longobardo¹, F.G. Carrozzo¹, M. Cardillo¹, F. Oliva¹, C. Magnifico¹, A. Raponi¹, F. Dirri¹, S. Stefani¹, ¹INAF-IAPS, via Fosso del Cavaliere 100, 00133, Rome, Italy (andrea.longobardo@inaf.it)

Introduction: It is not rare to meet people who ask why to allocate fundings dedicated to space exploration, that could be instead used for other “more important” problems, such as medical research.

The Space Twinkles project is realizing a docuseries which will start from this question in order to explain that the astrophysicists and space engineers work (i.e, the work made in INAF) is useful for something else. The explanation of this important fact to a generic public would represent a benefit for researchers working in space exploration and planetary science field. Indeed, it is true that our studies were born because humans look for answers to natural phenomena and have the need to expand their knowledge, in order to build their own future and to explore new worlds. It is also true that this need carried scientists and engineers at building new technologies so innovative to be used in other advances sectors and finally to our daily life.

Methods: The docuseries is a narrative chain, where INAF researchers illustrate small and big astronomical and space discoveries which allowed humanity to progress in scientific research and technological innovation. The documentary script focuses on what space exploration taught us and which benefits were derived from it.

This is done by dividing the documentary in episodes, each lasting about 10 minutes and dedicated to a particular aspect of our life which had benefit from space exploration. Each episode is structured as follows:

- 1) **INTRO:** an introduction that presents the context;
- 2) **SCIENTIFIC PROBLEM:** presentation of the issues experienced by researchers and the corresponding technological solution developed;
- 3) **TECHNOLOGY TRANSFER:** the explanation of how the developed technology led to benefits to our life in form of products commonly used in many fields;
- 4) **CONCLUSION:** a summary of advantages introduced by space and astronomical research.

Narrative transduction is made as most friendly and compelling as possible, by adopting the following methods:

- The researchers use a simple, non-specialistic and sometimes colloquial language and refer to daily situations common to everyone’s life. This allows the spectator to have empathy and also to identify himself to the researcher, and therefore to attend him more easily.
- Narrative is combined with 2d cartoon animation videos, helping the audience to understand

the stories which led to develop new objects used in several fields

Episodes: The *Space Twinkles* team is working to the following topics:

- Thermal infrared cameras have been developed to study the thermal emission from stars and planets but they are also used to measure rapidly the people’s temperature (e.g., during the COVID-19 pandemic), for building applications and for security issues.
- Principles of water purification systems developed for the International Space Station found application in areas where water is scarce and/or highly contaminated.
- The algorithm developed and used to improve the signal-to-noise ratio of the Hubble Space Telescope images found application to enhance the chance to detect carcinoms in mammographies.
- The material composing thermal blankets, currently used by firefighters and ambulances was born for a space application.
- Firefighters use several technologies developed for space applications, both directly and indirectly, such as respirators and satellites.
- GPS is a direct daily life technology based on satellite networks.

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