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PLANETARY DEFENSE OUTREACH ACTIVITIES IN THE FRAMEWORK OF THE
NEO-MAPP PROJECT FUNDED BY THE EUROPEAN COMMISSION

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Extended Abstract —

NEO-MAPP stands for *Near Earth Object Modelling And Payload for Protection*. This project is funded by the Horizon 2020 program of the European Commission and addresses the topic "Advanced research in Near Earth Objects (NEOs) and new payload technologies for planetary defence" (SU-SPACE-23-SEC-2019).

As part of the project, a work package is dedicated to the dissemination of results and public outreach. This includes the promotion of project results among professional and scientific community peers as well as general Public Relations (PR) activities involving a website presence and outreach on social media platforms to promote the project and to increase the level of awareness of the importance of planetary defense.

The project adopted the Hera mission under development at the European Space Agency (ESA) as the reference mission. A major part of the NEO-MAPP activities, including the outreach, support the mission preparation and future data interpretation.

I- General considerations

Planetary defense is an important and fascinating topic for the public. As astrophysicists and science communication officers, we are keenly noticing that the study of ways to protect the Earth from potential threats from space, such as asteroids or comets that could collide with our planet is a topic amazing the audience.

Here are some key points we thought to consider when building a communication plan around our topic:

- To emphasize the importance of planetary defense: to start by explaining why planetary defense is important. To talk about the potential risks posed by space debris and how they could affect life on Earth. Finally, to discuss

the history of major impacts in the Earth past, and how they have shaped our planet, all of that without generating unnecessary fears.

- To explain the scientific research behind planetary defense: to dive into the scientific research that goes into studying these threats. Talk about how astronomers and astrophysicists search for and track Near-Earth Objects (NEOs), and how they calculate their orbits to determine whether they pose a threat to Earth. Discuss the tools and techniques used to monitor the skies, such as ground-based telescopes and space-based observatories.

- To outline the different approaches to planetary defense: There are various approaches to planetary defense, including deflection, a method that proved to be functional, with the NASA's DART mission, and other techniques not yet implemented or, even, not authorized to be tried. To discuss these methods and to explain how they work. For example, deflection techniques involve changing the trajectory of an object so that it misses Earth, while disruption techniques involve breaking up the object. The aim is to talk about the advantages and disadvantages of each approach, and the challenges associated with implementing them.

- To highlight the global effort to protect our planet: to emphasize the fact that planetary defense is a global effort. To Talk about international collaborations, such as the United Nations Office for Outer Space Affairs (UNOOSA), the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG) that are working to develop strategies for

dealing with potential threats from space, to evaluate and to warn about a potential threat and to plan an appropriated and coordinated response. It is also primordial to discuss how different space agencies are contributing to this effort, notably the Planetary Defense Coordination Office (PDCO) at NASA and the Planetary Defence Office (PDO) at ESA, and how individuals can get involved, especially amateur astronomers monitoring the sky for NEOs.

Overall, a communication plan around planetary defense should focus on educating the public about the potential risks of NEOs and space debris on one hand and the scientific research and methods used to mitigate these risks on the other hand. By emphasizing the importance of planetary defense and highlighting the global effort to protect our planet, we help raising awareness about this important topic, without causing undue alarm.

II- Involvement of the European Union in planetary defense

The European Union (EU) has taken an active role in the field of planetary defense, working to develop strategies and technologies to mitigate potential threats from asteroids and other NEOs.

In 2016, the EU established the Space Surveillance and Tracking (SST) program, which aims to develop a comprehensive system for monitoring space debris and tracking potentially hazardous objects. The SST program involves a network of ground-based telescopes and radar systems, as well as space-based sensors, that work together to detect and track objects in space.

In addition to the SST program, the EU has also invested in research and development of deflection and disruption technologies. In 2012, it funded for 3 years the NEOShield consortium in its FP7 program, followed in 2015 by the NEOShield2 Consortium funded for 2.5 years in its Horizon 2020 framework, aimed at studying the kinetic impactor technology and modelling, as well as characterizing NEOs with ground-based telescopes. In 2020, NEO-MAPP and NEOROCKS were then funded by the Horizon 2020 framework for 3 years to support different NEOs related activities.

Overall, the EU has demonstrated a strong commitment to planetary defense and is actively working to support the development of technologies that can help protect the Earth from potential asteroid impacts.

III- Communication activities in NEO-MAPP

NEO-MAPP started in February 2020. Within its framework various events (e.g., public lectures, space cafes) have been organized. Regular contributions to the public website help to raise public awareness of the hazard posed by small celestial bodies and the efforts made to mitigate it. Effective public outreach activities are also performed to inform the public and interested parties

of the advances of the various tasks of the project and the Hera mission development, which include press releases of publications in major international peer-reviewed journals by the team, dissemination of information for the public via both the project and the Hera community websites, collaboration with journalists, coordination of articles for the popular literature, public lectures, interviews for social networks, televisions, radios and other on-line medias.



figure 1: Public conference of Dr. Patrick Michel.

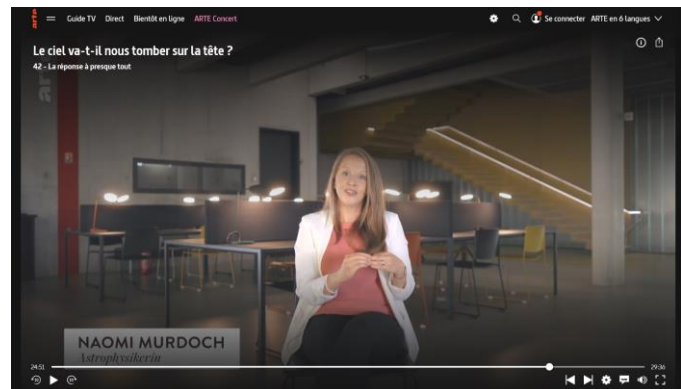


figure 2: TV documentary with Dr. Naomi Murdoch.

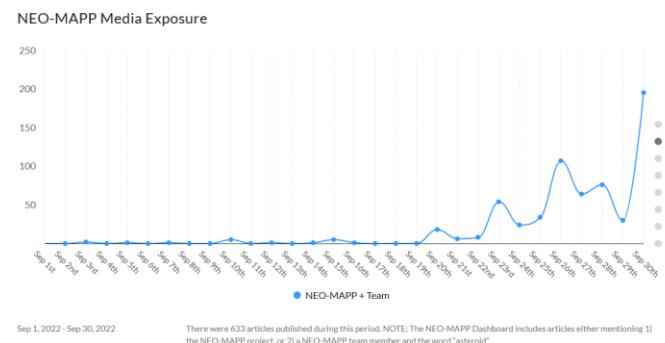


figure 3: NEO-MAPP media exposure.

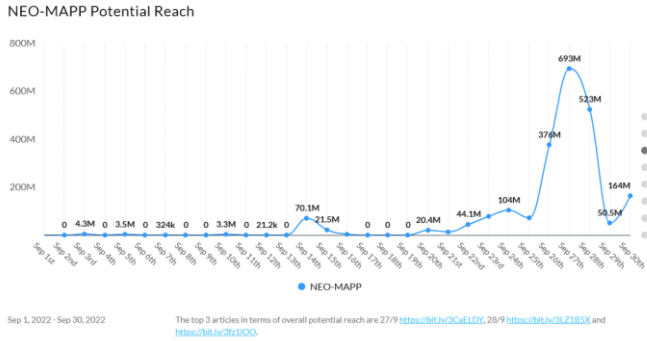


figure 4: NEO-MAPP potential reach

Figures 1 and 2 show examples of our efforts to promote the topic of planetary defense and its various areas of study, such as those performed within our project and the Hera mission preparation. In addition, figures 3 and 4 show the metrics (made with Meltwater) we use to measure the impact of our planetary defense outreach activities on the public and medias.

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