

NEOShield

A Global Approach to Near-Earth Object Impact Threat Mitigation



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A near-Earth asteroid heads for the Earth's surface. NEOShield will help to prevent this scene becoming reality.



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Project Coordinator

ABSTRACT

NEOShield brings together an international team to address the global issue of hazardous NEO impact prevention. The feasibility of space missions to test our ability to prevent a potentially catastrophic impact will be studied and detailed designs of appropriate missions provided.

PREVENTING HAZARDOUS NEAR-EARTH OBJECTS FROM IMPACTING THE Earth

Collisions of asteroids and comets with the Earth have taken place frequently over geological history. Thousands of near-Earth objects (NEOs), mainly asteroids, have been discovered over the past 20 years and the reality of the impact hazard has been laid bare. Can we protect our civilization from the next major impact?

NEOShield will address in detail the open questions relating to realistic options for preventing the collision of a NEO with the Earth. Solutions will be provided to critical scientific and technical issues that currently stand in the way of demonstrating the feasibility of promising mitigation options via test missions. Detailed test-mission designs will be provided for the most feasible mitigation concepts, facilitating the rapid development of actual test missions at a later stage.

The NEOShield concept includes laboratory experiments and associated modelling to provide the necessary data pertaining to the behaviour of a NEO during a deflection attempt.

The experimental results and modelling will help to improve our understanding of the nature of NEOs and allow the feasibility of mitigation techniques and mission designs to be accurately assessed. An international response strategy will be considered for implementation when an actual impact threat arises. Account will be taken of complementary efforts currently in progress (e.g. by the UN, ESA, NASA). Colleagues outside the NEOShield consortium involved in such activities will be invited to contribute to the establishment of a broad international strategy.

QUESTIONS & ANSWERS

What is the project designed to achieve?

Physical parameters relating to the properties of NEOs will be determined from available observational data and the results of our laboratory experiments and computer simulations. Relevant technologies, such as autonomous spacecraft guidance, will be adapted and developed. Detailed designs of feasible demonstration missions will be presented.

Why is this project important for Europe?

NEOShield will work towards testing our ability to prevent the impact of a hazardous NEO. Europe has extensive experience in the development of relevant space technology. While to-date activities in this field have been dominant in non-European countries, NEOShield will establish Europe as a global player.

How does this project benefit European citizens?

Europe covers a large part of the globe, is densely populated, and has a sophisticated, highly networked society. Its risk of suffering catastrophic human loss and economic damage, as the result of an impact, is relatively high. NEOShield will make a significant contribution to preventing a serious impact.

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LIST OF PARTNERS

- Deutsches Zentrum für Luft - und Raumfahrt (DLR), Germany
- Observatoire de Paris, France
- Centre National de la Recherche Scientifique, France
- The Open University, United Kingdom
- Fraunhofer Ernst-Mach-Institut, Germany
- The Queen's University of Belfast, United Kingdom
- Astrium GmbH, Germany
- Astrium Limited, United Kingdom
- Astrium S.A.S., France
- Deimos Space, Spain
- SETI Institute Corporation Carl Sagan Center, United States
- TsNIIMash, Russian Federation
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PROJECT INFORMATION

A Global Approach to Near-Earth Object Impact Threat Mitigation
(NEOShield)

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