



FUTURE PERSPECTIVES OF THE NEO PHYSICAL PROPERTIES



DATABASE BY THE NEO ROCKS EU PROJECT



I. Di Pietro¹, E. Perozzi¹, A. Mediavilla², E. Dotto³, A. Zinzi^{1,4}, M. Giardino^{1,4}, A. Giunta¹ and the NEOROCKS team*

¹ ASI - Agenzia Spaziale Italiana, Italy (ilaria.dipietro@asi.it)

² DEIMOS Space, Spain

³ INAF – Osservatorio Astronomico di Roma, Italy

⁴ SSDC – Space Science Data Center, ASI, Italy

NEOROCKS (Near-Earth Object Rapid Observation, Characterization and Key Simulations) is a European project funded by the UE Horizon 2020 programme whose aim is to increase our knowledge of the NEO physical characterization through observations and data dissemination.

- Ambition 1: Networking large aperture telescopes
- Ambition 2: Advancing NEO physical properties modelling and simulations
- Ambition 3: Improving the orbit determination process
- Ambition 4: Addressing the imminent impactors monitoring
- **Ambition 5: Establishing a NEO physical properties data center**
- Ambition 6: Fostering international cooperation for follow-up
- Ambition 7: Raise the public awareness on NEO and impact hazard



NEOROCKERS

- ITALIAN SPACE AGENCY, ITALY
- NATIONAL INSTITUTE OF ASTROPHYSICS, ITALY
- UNIVERSITY OF PADOVA, ITALY
- PARIS OBSERVATORY, FRANCE
- COTE D'AZUR OBSERVATORY, FRANCE
- UNIVERSITY OF EDINBURGH, UNITED KINGDOM
- ASTRONOMICAL INSTITUTE, CZECH ACADEMY OF SCIENCES, CZECH REPUBLIC
- CANARY ISLANDS INSTITUTE OF ASTROPHYSICS, SPAIN
- SPACE DYNAMICS SERVICES, ITALY
- DEIMOS GROUP, SPAIN AND ROMANIA
- NEOSPACE, POLAND
- RESOLVO, ITALY

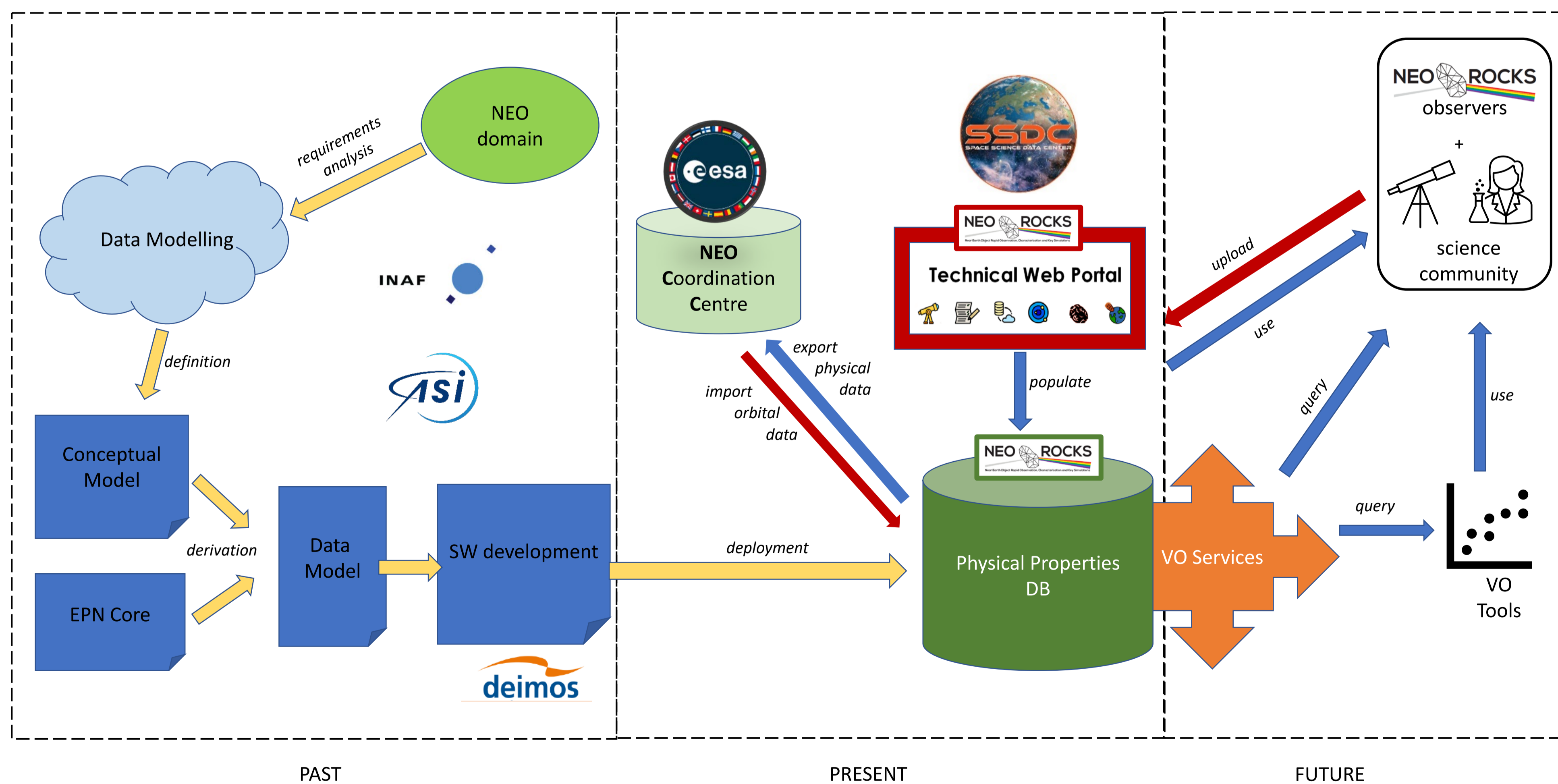
HOW?

One of the Major features of the NEOROCKS Technical Web Portal has been the development and the deployment of an advanced NEO Physical Properties Database. Following the IVOA (International Virtual Observatory Alliance) standards, a data model has been designed having the ability to store, maintain, give access and be regularly updated at all different levels of processing, from raw data to final products. Therefore, the database is compliant with existing VO services using the EPN-CORE [1] standards and matches the FAIR (Findable, Accessible, Interoperable, Reusable) principles [2].



The NEOROCKS Technical Portal will be migrated at the end of the project inside the Space Science Data Centre (SSDC) [3] of the Italian Space Agency (ASI) (<https://www.ssdsc.asi.it>). The possibility of having a reference repository of NEO physical properties data hosted by an existing well established astronomical data centre, ensures that the efforts carried out during the project remain available to the international astronomical community and further enhanced in the future.

The NEOROCKS Physical Properties Database ultimate goal is to provide, and actively engage, the scientific NEO community with an enduring repository and on-line tools, able to support and maximize the scientific exploitation (and return) of data, and to optimize follow-up observations for planetary defence applications.



WHY?

According to the several European Union's several R&D actions (e.g. [4] [5]) (NEOROCKS being the most recent), the EU 2021-27 Space Programme about NEOs [6] and the harmonization with ESA activities through Framework Partnership Agreement (FFPA) [7], achieving significant progresses on NEO physical characterization is a major goal with the exploitation of already available technical resources as first step. Building on that, care has been taken to consider the ESA NEO Coordination Centre [8] as a main data source for the NEOROCKS Technical Portal and database. Finally, a permanent facility enhances the experience gained during the project at a global level, paving the way toward an international cooperation on NEO physical characterization and, hence, providing roadmaps of the next steps. Nevertheless, the NEOROCKS physical properties database can be easily integrated into future open operational European NEO monitoring systems since the Europlanet [9] guidelines for developing the data access services have been applied.



SCAN ME



References: [1] Erard, S., et al. (2022). EPN-TAP: Publishing Solar System Data to the Virtual Observatory Version 2.0 (<https://www.ivoa.net/documents/EPNTAP/20220822/REC-EPNTAP-2.0.html>) [2] Wilkinson, Mark D., et al. (2016) Scientific data, 3.1: 1-9. [3] Zinzi, Angelo, et al. (2021) LPI Contributions 2549 (2021): 7032. [4] NEOShield-2 – Science and Technology for Near-Earth Object Impact Prevention <https://cordis.europa.eu/project/id/640351>. [5] STARDUST – The Asteroid and Space Debris Network. <https://cordis.europa.eu/project/id/317185> [6] The EU Space Programme <https://www.euspa.europa.eu/european-space/eu-space-programme>. [7] FFPA ESA Vision. <https://vision.esa.int/tag/ffpa/> [8] ESA Near-Earth Objects Coordination Centre <https://neo.ssa.esa.int/> [9] Europlanet 2024. <https://www.europlanet-society.org/europlanet-2024-ri/>

*The NEOROCKS Team is also composed by M. Banaszekiewicz, S. Banchi, M.A. Barucci, F. Bernardi, M. Birlan, B.Carry, A. Cellino, J. De Leon, M. Lazzarin, E. Mazzotta Epifani, D. Perna, P. Pravec, C. Snodgrass, C. Teodorescu, S. Anghel, A. Bertolucci, F. Calderini, F. Colas, A. Del Vigna, A. Dell'Oro, A. Di Cecco, L. Dimare, P. Fatka, S. Fornasier, E. Frattin, P. Frosini, M. Fulchignoni, R. Gabryszewski, T. Hromakina, J. Huntingford, S. Ieva, J.P. Kotlarz, F. La Forgia, J. Licandro, H. Medeiros, F. Merlin, J. Nomen Torres, V. Petropoulou, F. Pina, G. Polenta, M. Popescu, A. Rozek, P. Scheirich, A. Sergeyev, A. Sonka, G.B. Valsecchi, P. Wajer.

