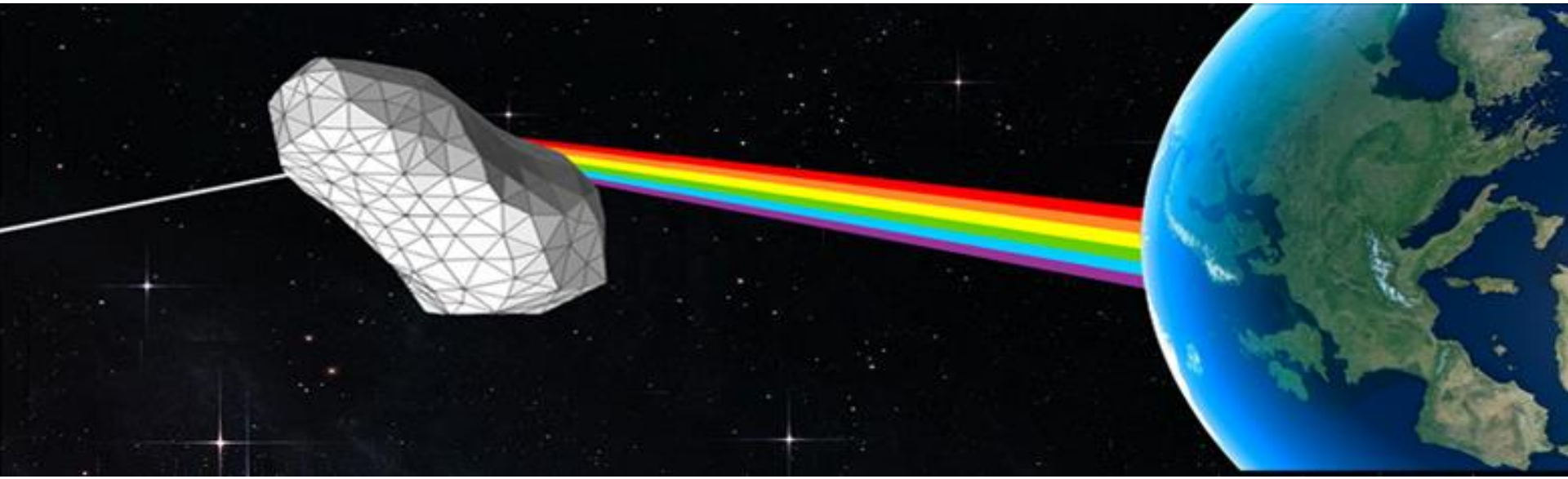
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870403

NEOROCKS - The NEO Rapid Observation, Characterization and Key Simulations



Elisabetta Dotto
INAF-OAR
on behalf of the NEOROCKS team

NEO ROCKS
Near Earth Object Rapid Observation, Characterization and Key Simulations

NEOROCKS - The NEO Rapid Observation, Characterization and Key

Participant organisation name	Country
Istituto Nazionale di Astrofisica (coordinator)	Italy
Agenzia Spaziale Italiana	Italy
University of Padova	Italy
LESIA, IMCCE - Observatoire de Paris	France
Observatoire de la Cote d'Azur	France
University of Edinburgh	UK
Astronomical Institute of the Czech Academy of Sciences	Czech Republic
Instituto de Astrofisica de Canarias	Spain
SpaceDyS s.r.l.	Italy
DEIMOS Space s.l.u.	Spain
DEIMOS Space s.r.l.	Romania
DEIMOS Castilla La Mancha	Spain
NeoSpace sp z.o.o	Poland
Resolvo Srl	Italy

Programme:H2020-Work Programme 2018-2020-Leadership in Enabling and Industrial Technologies Space
Call: SU-SPACE-23-SEC-2019 – Advanced research in Near Earth Objects (NEOs) and new payload technologies for planetary defence *(EC Decision C(2018)4708 of 24 July 2018)*
"Improvement of our knowledge of the physical characteristics of the NEO population."
Timeline: January 2020 - June 2022 (30 months)

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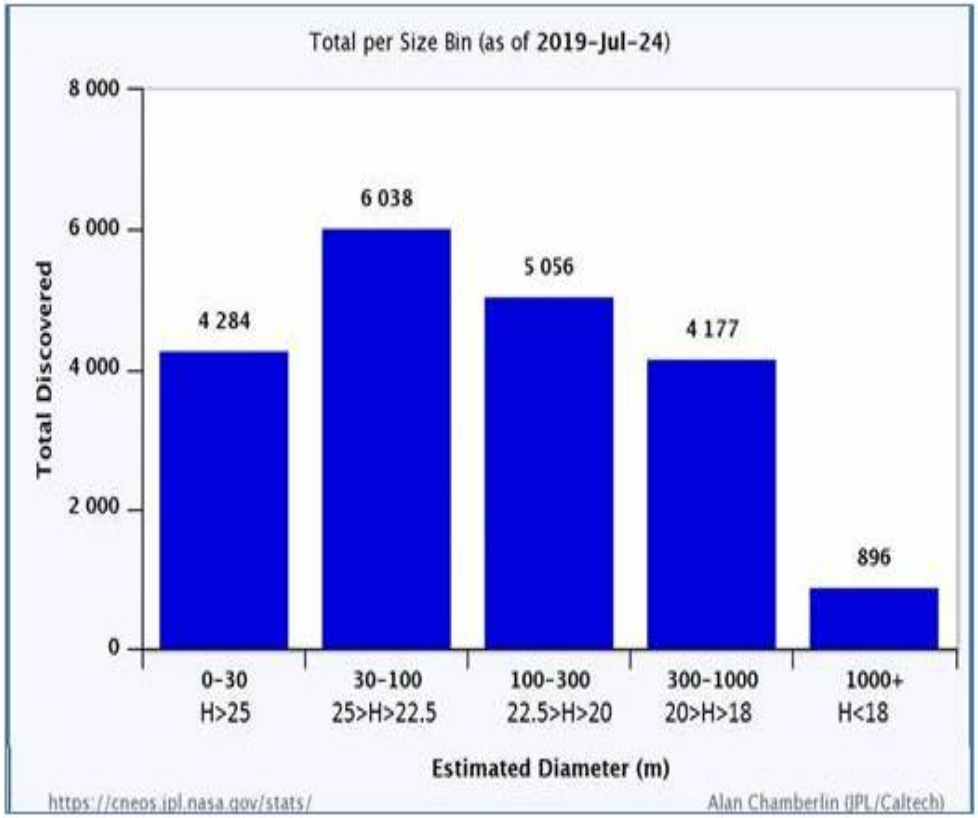
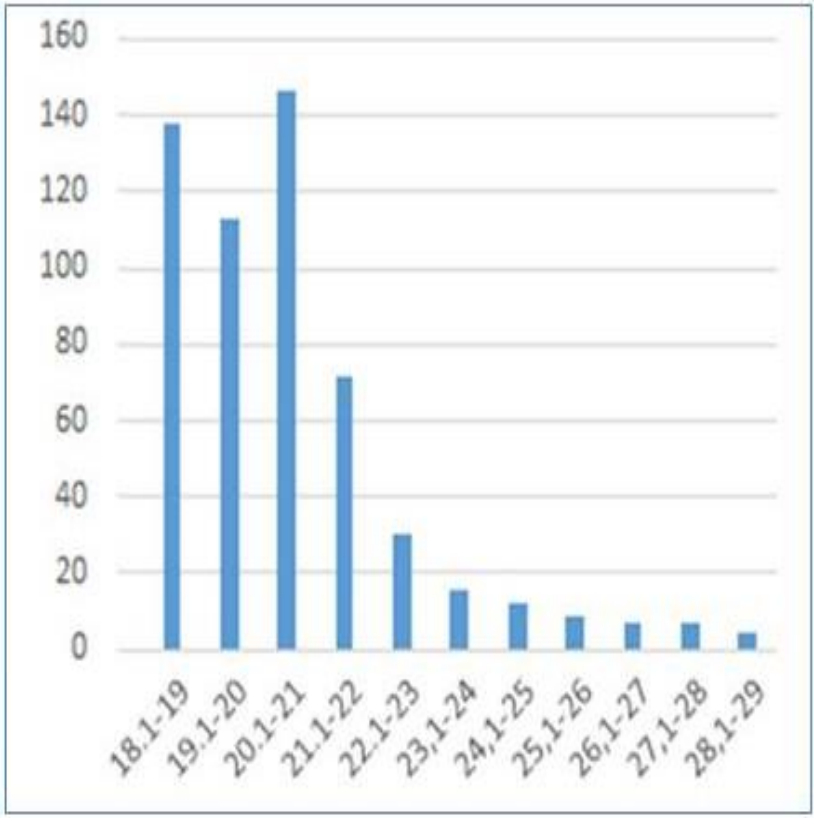
NEOs Observations and knowledge





Total number of known NEOs grouped according to their absolute magnitude H and corresponding size (left); The distribution of the absolute magnitude H of NEOs with spectroscopic characterization.

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OUR CHALLENGE: improving the physical characterization of Near Earth Objects and of the implications for their origin and evolution as well as for planetary defense.

NEOROCKS proposes an innovative approach focused on:

a) performing **high-quality physical observations** and foster the related **data reduction process**;
b) investigating the strong relationship between the **orbit determination of newly discovered objects and the quick execution of follow-up observations** in order to face the threat posed by the "imminent impactors";
c) profiting of the European industrial expertise in on-going Space Situational Awareness initiatives to **plan and execute breakthrough experiments foreseeing the remote tasking of highly automatized robotic telescopes**, in order to provide a proof-of-concept rapid response system;
d) guarantee extremely **high standards in the data dissemination** through the involvement at agency level of a data centre facility already operating in a European and international context.

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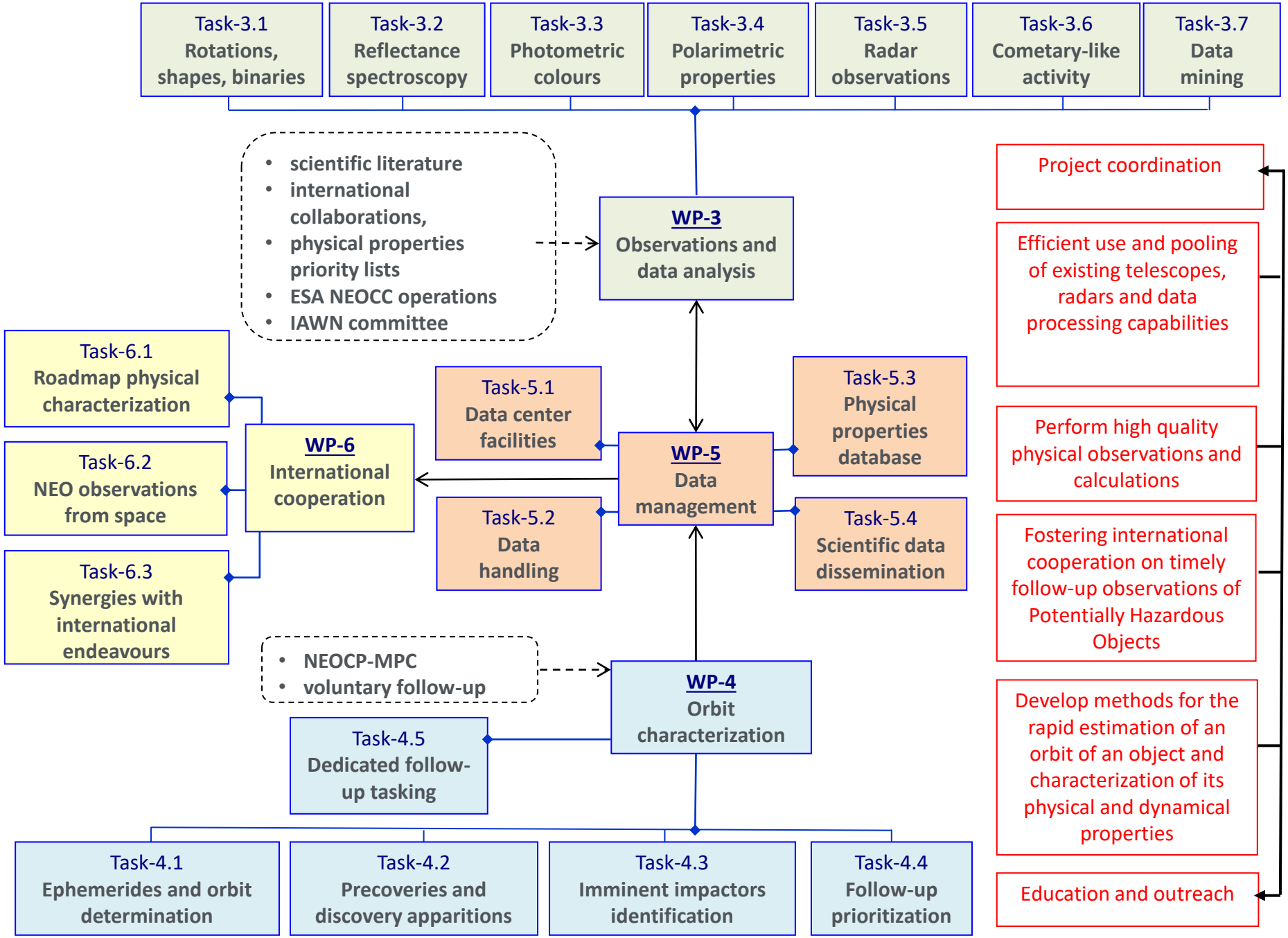
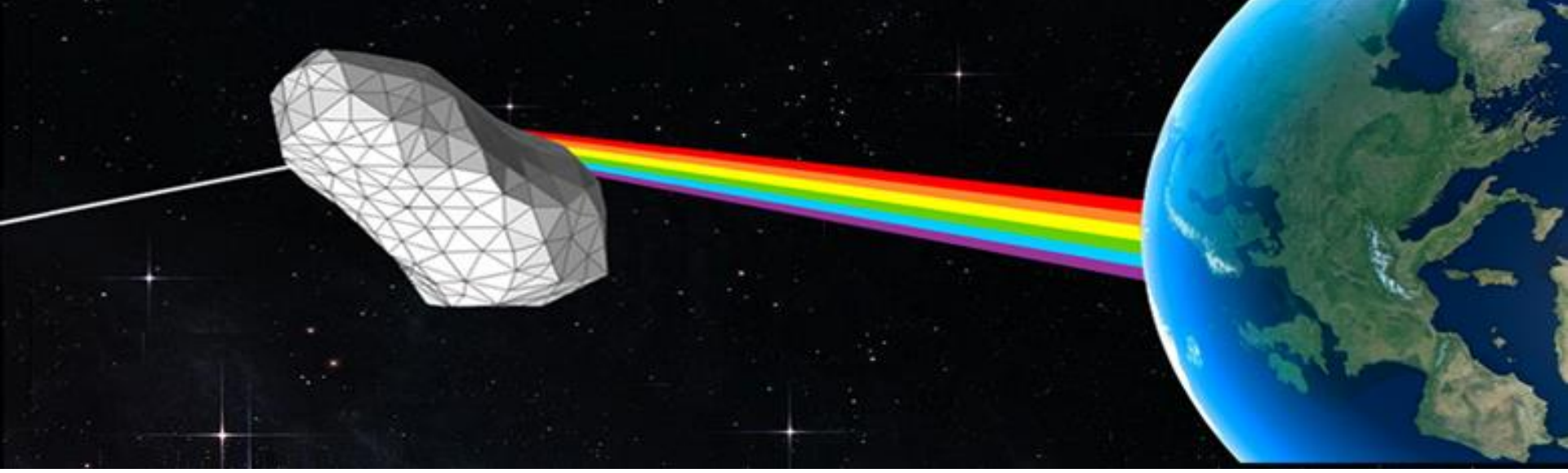

Task-3.1 Rotations, shapes, binaries
Task-3.2 Reflectance spectroscopy
Task-3.3 Photometric colours
Task-3.4 Polarimetric properties
Task-3.5 Radar observations
Task-3.6 Cometary-like activity
Task-3.7 Data mining
scientific literature
international collaborations,
physical properties priority lists
ESA NEOCC operations
IAWN committee
WP-3 Observations and data analysis
Project coordination
Efficient use and pooling of existing telescopes, radars and data processing capabilities
Task-6.1 Roadmap physical characterization
Task-6.2 NEO observations from space
Task-6.3 Synergies with international endeavours
WP-6 International cooperation
Task-5.1 Data center facilities
Task-5.2 Data handling
WP-5 Data management
Task-5.3 Physical properties database
Task-5.4 Scientific data dissemination
Perform high quality physical observations and calculations
Fostering international cooperation on timely follow-up observations of Potentially Hazardous Objects
NEOCP-MPC
voluntary follow-up
WP-4 Orbit characterization
Task-4.5 Dedicated follow-up tasking
Develop methods for the rapid estimation of an orbit of an object and characterization of its physical and dynamical properties
Task-4.1 Ephemerides and orbit determination
Task-4.2 Precoveries and discovery apparitions
Task-4.3 Imminent impactors identification
Task-4.4 Follow-up prioritization
Education and outreach



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