Mathematics for Planetary Defense
Specific Seminar – Curriculum 3
2024, May 16, 11 a.m.

Speaker:
Prof. Giacomo Tommei, University of Pisa - Department of Mathematics

Abstract:
Planetary defense consists of monitoring and protecting the Earth from dangers coming from space, including asteroids and comets. Mathematics is fundamental in such activity, through the Orbit Determination (OD) and Impact Monitoring (IM) tools.
In this lecture we will focus on the mathematical methods to perform the OD and IM of Near-Earth Objects, highlighting the challenges for the future and showing some insights from the Hera mission.

References:

- L. Bedini, G. Tommei, New Yarkovsky drift detections using astrometric observations of NEAs, Experimental Astronomy, Volume 57, 4 (2024)
- Milani, S.R. Chesley, M.E. Sansaturio, G. Tommei and G.B. Valsecchi, Nonlinear impact monitoring: Line of Variation searches for impactors, ICARUS, Volume 173, Issue 2 (Febbraio), pp. 362-384 (2005)
- Milani and G.F. Gronchi, Theory of orbit determination, CUP (2010)
- M. Mochi, G. Tommei, New tools for the optimized follow-up of imminent impactors, Universe 7(1), 10 (2021)
- G. Tommei, On the Impact Monitoring of Near-Earth Objects: mathematical tools, algorithms and challenges for the future, Universe 7(4), 103 (2021)

Online attendance:
Meeting ID: 879 9461 4839
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Zoom Link: https://unitn.zoom.us/j/87994614839?pwd=cEtlZER1dlZiTnNJWjRCQldpSm03QT09

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