MINOR BODIES MAKING AN IMPACT ON EDUCATION. M. Sundin[1] and P. Ekberg[2], [1]Department of Physics, University of Gothenburg, 412 96 Gothenburg, Sweden, maria.sundin@physics.gu.se, [2]Larkverket, Kvarnfallsvagen 7, 42353 Torslanda, Sweden, peter@peterekberg.se

Introduction: The undergraduate course *Minor bodies in the Solar system* is a brand-new course starting in 2022 by the Department of Physics at the University of Gothenburg, Sweden. This paper introduces the core concepts and presents a pedagogical structure for expanded usage. Input and future collaborations are encouraged and appreciated.

Scientific content: The course is providing current knowledge on the formation of the solar system and minor bodies. A basic background is delivered, as well as recent research, on dwarf planets, moons, asteroids, comets, ring systems, impacts and interstellar objects in the solar system. Overviews and inspiration can be found in e.g. [1], [2] and [3]. Insights into space exploration through earth-based telescopes, space probes, landers and sample-return missions are also included.

Interdisciplinary content: An interdisciplinary angle is embedded in the material. The ethics of space exploration [4] in the course context involves issues regarding natural resources, space mining policy, asteroid impacts, nature, environment and planetary protection, astronaut welfare, and discussions on under what banner humanity is striking out into space. What, if any, are our moral obligations to the space environment? Should we go as exploiters and colonists or as scientific travelers in quest of enhancing knowledge, with a "prime directive" of minimal interference [5]?

Further interdisciplinary subjects include minor bodies in history, art, music and the popular culture, see e.g. [6].

Examination and interaction with LPSC: During the course, the students will be given six assignments on different levels. One of the these will be to read and explain the contents of a public poster from LPSC 52 or LPSC 53. This approach was tested and valued by the students on a smaller scale in 2021 on the course *The Mathematical Guide to Ganymede* (given in collaboration between the Depts. of Mathematics and Physics at the University of Gothenburg). In another assignment the students will be allowed to choose one, and randomly be allotted one, minor body for a project.

Further discussions: Next year, we hope to present data on which subjects among the posters and specific minor bodies raised the most interest among the approximately 200 students. Perhaps, these acquired facts could be beneficial for the authors of the LPSC posters and lecturers. Also, we intend to discuss further expansion on the method of examination and evaluation.

References:

[1] Rickman H. *Small Bodies Of The Solar System: A Guided Tour For Non-scientists* (2021), World Scientific Europe Ltd

[2] Fernandez J. et al. (2010) *Icy Bodies of the Solar System (IAU S263)*, Cambridge University Press

[3] Stern S.A. (2021) *The Pluto System After New Horizons*, University of Arizona Press

[4] Sundin M., et al (2021) *Mars — Education of Ethics and Planetary Processes*, LPSC 52

[5] Vacker B (2018) *Specter of the monolith*, Centre for media and destiny, p 166-169

[6] Bobrowsky P.T. and Rickman H. (2007) *Comet/Asteroid Impacts and Human Society*, Springer