

Dusan Marceta, PhD

I teach courses in astrodynamics, orbital mechanics, continuum mechanics and classical mechanics at the undergraduate, master and doctoral level. Results of my research are published in leading peer-reviewed journals. My expertise is atmospheric flight mechanics and orbital mechanics.



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CURRENT POSITION

Assistant professor
Department of Astronomy
Faculty of Mathematics
University of Belgrade, Serbia

Mar 2016 – present

EDUCATION

Department of Astronomy, Faculty of Mathematics, University of Belgrade, Serbia

Oct 2015

PhD in Astronomy, PhD thesis “Possibilities and optimization of landing on the southern hemisphere of Mars”

Aerospace Department, Faculty of Mechanical Engineering, University of Belgrade, Serbia

Dec 2006

Master in Aerospace Engineering, master thesis “Mechanics of orbital flight”

TEACHING EXPERIENCE

I teach courses in three levels of education:

- Doctoral level courses:
 - Theory of motion of artificial Earth satellites
 - Satellite astro-geodesy
- Master level courses:
 - Design of space missions
 - Software packages in astronomy
- Undergraduate level courses:
 - Continuum mechanics
 - Classical Mechanics
 - Processing of astronomical data

STUDENT ADVISING AND COMMITTEES

- Master thesis advisor – student Vanja Petkovic (working title: “Orbital maneuvers about irregular bodies”), University of Belgrade (Currently in process)
 - Master thesis advisor – student Miljan Kolcic (working title: “Orbit determination from short observational arcs – application to LSST project”), University of Belgrade (Currently in process)
 - PhD examination committee – student Viktor Radovic (title: “Development of an algorithm for examination of the association of asteroids to families”), University of Belgrade (2017)
 - Master thesis examination committee – student Djordje Markovic (title: “On the probability of collision between intergalactic meteors and potentially habitable planets”), University of Belgrade (2016)
 - Master thesis examination committee – student Ana Todovic (title: “Determination asteroid family ages by modelling of Yarkovsky effect”), University of Belgrade (2016)
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INTERNATIONAL COOPERATION

- Leader of the group of researchers from University of Belgrade for the development of algorithm for determination of asteroid orbits from small observational arcs for implementation on LSST project 2016 – present
 - Member of the team which consists of researchers from several Serbian academic institutions and Paris Observatory – LEISA, for the project “Preparation and realization of the quasi-thermal noise ionospheric CubeSat Mission”, proposed under program “Pavle Savic 2018”, co-financed by French and Serbian governments (currently under evaluation) 2017
 - Leader of the program of cooperation between Faculty of Mathematics and Czech Academy of Sciences, which resulted in regular practice of the Serbian students on Astronomical observatory Ondrejov, Prague 2009 – present
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PROFESSIONAL EXPERIENCE

- Official provider of astronomical data to Serbia and Montenegro Air Traffic Services (SMATSA) 2015 – present
 - Design Engineer at Hitard Engineering Company, engineering and design office for heat exchangers and pressure vessel May 2007 – Dec 2008
 - Principal designer for aerodynamics and flight mechanics of unmanned aerial vehicle NT-150, currently produced by Composite Technology Team Company <http://www.ctt.rs/products/> 2005 – 2006
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AWARDS

- Fellowship awarded by Japan Aerospace Exploration Agency (JAXA), for presenting research about meteoroid impact risk for a spacecraft on the transfer trajectories to Mars, at 30th International symposium on space technology and science, Kobe, Japan 2015
- Emerging Space Leader grant awarded by International Astronautical Federation (IAF), for presenting the ideas for landing on the southern hemisphere of Mars, at International Astronautical Congress, Naples, Italy 2012
- Research Fellowship of the EUROAVIA student association for participation in the summer workshop project: “Preliminary design 2005

of a heavy helicopter”, co-hosted by Agusta-Westland and Polytechnico di Milano, Milan, Italy

LANGUAGES

English - fluent
French - basic
Serbian - native language

PROGRAMMING SKILLS

Languages: Python, Matlab, Visual Basic

WORK IN PUBLIC OUTREACH

In cooperation with Islamic Community of Serbia, I worked on the development of computer program which summarizes astronomical aspects of Christian and Islamic calendars. This work was presented at SEEDI conference on digitalization of cultural heritage, Sarajevo, Bosnia and Herzegovina (2010) with paper *Calendar databases and algorithms for conversions: Christian and Islamic calendars in Balkan region.* 2010

REFEREED PUBLICATIONS

1. Radovic, V., Novakovic, B., Carruba, V., Marceta, D.: An automatic approach to exclude interlopers from asteroid families, *Monthly Notices of the Royal Astronomical Society*, Volume 470, Issue 1, pp. 576-591, (2017)
2. Marceta, D., Segan, S., Rasuo, B., Rackovic, K.: Meteoroid environment on the transfer trajectories to Mars, *Aerospace Science and Technology*, Volume 56, pp. 14-21 (2016)
3. Marceta D., Segan, S., Rasuo, B.: Influence of seasonal cycles in Martian atmosphere on entry, descent and landing sequence, *Acta Astronautica*, Volume 98, pp. 163-168 (2014)
4. Marceta, D.: The Effects of the Diurnal Atmospheric Variability on Entry, Descent and Landing on Mars, *Serbian Astronomical Journal* , Volume 189, pp. 69-77 (2014)
5. Marceta D., Segan, S.: The distributions of positions of Minimal Orbit Intersection Distances among Near Earth Asteroids, *Advances in Space Research*, Volume 50, Issue 2, pp. 256-259 (2012)

6. Segan, S., Milisavljevic, S., Marceta, D.: A Combined Method to Compute the Proximities of Asteroids, *Acta Astronomica*, Volume 61, Issue 3, pp. 275-283 (2011)
7. Segan, S., Marceta, D.: Possibilities of Improving the TD88 Atmospheric Total Density Model, *Serbian Astronomical Journal*, Volume 181, pp. 57-61 (2010)

SELECTED ORAL PRESENTATIONS AND CONFERENCE POSTERS

8. Marceta D.: Mutual centennial cycles in solar activity and Earth rate of rotation, *Statistical Challenges in Modern Astronomy*, Pittsburgh, USA (2016)
9. Marceta D.: Meteoroid Environment on the Transfer Trajectories to Mars, *International Symposium on Space Technology and Science*, Kobe, Japan (2015)
10. Marceta D., Segan, S., Rasuo, B.: Astronomical Aspects of Entry, Descent and Landing Sequence on Mars, *64th International Astronautical Congress*, Beijing, China (2013)
11. Marceta, D., Rasuo, B.: Possibilities for the Landing on Mars Southern Highlands, *63rd International Astronautical Congress*, Naples, Italy (2012)
12. Marceta D., Segan S.: Influence of Variations in the Earth's Atmosphere on the Physical and Chemical Processes during Entry of a Meteoroid, *Asteroids, Comets, Meteors*, Niigata, Japan (2012)
13. Marceta D., Segan S.: Cycles in the Martian Atmosphere-the Influence on Entry, Descent and Landing Profiles, *39th COSPAR Scientific Assembly*, Mysore, India (2012)
14. Marceta D., Bokan, N., Segan S.: Effects of radiation on the geometry of zero-velocity surfaces in the photo-gravitational circular restricted 3-body problem, *XVIII General Assembly of International Astronomical Union*, Beijing, China (2012)
15. Marceta D., Segan S.: Connection between the solar activity and the Earth's rate of rotation, *XVIII General Assembly of International Astronomical Union*, Beijing, China (2012)
16. Marceta, D., Segan, S., Glisovic, N.: Detection of the Mutual Periodical Changes in the Earth Rate of Rotation and the Solar Activity by Singular Spectrum Analysis, *Journées 2011 - Systèmes de référence spatio-temporels*, Vienna, Austria (2011)
17. Marceta D., Segan S., Samardzija, B: "Launching Satellite and Orbital Transfers, *XVI National Conference of Astronomers of Serbia*, Belgrade, Serbia (2011)
18. Marceta D., Segan S.: "Some Heuristics in Determination of Proximities of Confocal Elliptical Orbits", *XVI National Conference of Astronomers of Serbia*, Belgrade, Serbia (2011)

19. Marceta, D., Segan, S.: Method for Prediction of ΔT based on Long-Periodic terms in the Earth's Rate of Rotation, *Journées 2010 - Systèmes de Référence Spatio-Temporels*, Paris, France (2010)
 20. Marceta D.: Some Aspects of Circular Restricted Three Body Problem from Differential Geometry Point of View, *VII Bulgarian-Serbian Astronomical Conference*, Bulgaria (2010)
 21. Segan S., Marceta, D.: Orbit determination and Parameter Estimation: Extended Kalman Filter versus LSQOD, *XV National Conference of Astronomers of Serbia*, Belgrade, Serbia (2008)
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