

## Andrea Di Ruscio

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### CONTACT INFORMATION

*Phone:* (+39) 340 8358183  
*E-mail:* [andrea.diruscio@uniroma1.it](mailto:andrea.diruscio@uniroma1.it),  
[diruscio.andrea@gmail.com](mailto:diruscio.andrea@gmail.com)  
*Address:* Via di Fontana Vecchia 6,  
Frascati (RM), Italy,  
00044



### RESEARCH INTERESTS

**Radio science, deep space tracking systems, orbit determination, planetary geodesy and ephemerides**

### EXPERIENCE

**Ingénieur d'études,** December 2017 to June 2018  

- [OCA Géoazur Laboratory](#), Sophia Antipolis (France)
- Processing of Cassini navigation data for the development of INPOP planetary ephemerides.
- Supervisor: Prof. Agnes Fienga

### EDUCATION

**Ph.D., Joint Research Doctoral Thesis,** November 2017 - Present  

- Aeronautical and Space Engineering at [Sapienza University](#), Rome (Italy)
- Earth and Universe Sciences at [Université de la Côte d'Azur](#), Nice (France)
- Thesis Topic: "*Use of radio science and navigation data for the construction of planetary ephemerides*"
- Supervisors: Prof. Luciano Iess (Sapienza) and Prof. Agnes Fienga (UCA)

**M.S., Space and Astronautical Engineering,** October 2014 to July 2017  

- [Sapienza, University](#), Rome (Italy)
- 110 / 110
- Space Flight Mechanics, Gasdynamics, Control Systems, Space Structures, Electronics, Space Missions and Systems, Space Propulsion, Robotic Systems, Spacecraft Design
- Thesis: "*An assessment of a new tracking configuration for the reduction of antenna mechanical and tropospheric noise in deep space Doppler measurements*"; the new technique studied provides for a reduction of antenna mechanical and tropospheric noise by using a proper combination of simultaneous two- and three-way Doppler data. In particular the analysis focuses on its application on ESA BepiColombo and NASA Cassini missions. Advisor: Prof. Luciano Iess

**Erasmus+,** February to July 2016  

- [Institut Supérieur de l'Aéronautique et de l'Espace](#), ISAE-SUPAERO, Toulouse (France)
- Telescopes and Space Observation, Meteorology and Oceanography, Real-time Guidance, Military Airplane Design, Microsat Design.
- Stage de M1: "*Exploring Venus interior structure with barometers onboard balloons*". Advisor: Prof. David Mimoun

**B.S., Aerospace Engineering,** October 2011 to October 2014  

- [Sapienza, University](#), Rome (Italy)
- 108 / 110
- Calculus, Geometry, Mechanics, Chemical, Thermodynamics, Electromagnetism, Mechanics of Solid and Structures, Programming and Numerical Methods, Materials Science and Technology, Aerodynamics, Aerospace Structures, Telecommunication Systems

- Thesis: “*Calculus of the atmospheric drag on a Venus orbiter*”; the Thesis investigates Venus’ atmospheric drag at altitudes ranging between 200 and 250 km, with particular attention to the solar radiation dependence (F10.7). The study relies on Pioneer Venus data, with a comparison between those of ESA’s Vex. Advisor: Prof. Luciano Iess

**Liceo Scientifico,**

September 2006 to June 2011

- Liceo Scientifico Bruno Touscheck, Grottaferrata (Italy)
- 90 / 100

**PUBLICATIONS**

- **Feasibility of an innovative technique for noise reduction in spacecraft Doppler tracking**, Notaro V.; Mariani M. J., Di Ruscio A., Iess L., Armstrong J. W., Asmar S. W., *IEEE Aerospace Conf. Proceedings*, Vol. 2018, p. 1109-1118, doi:10.1109/AERO.2018.8396480
- **Improvements of BepiColombo’s radio science experiment through an innovative Doppler noise reduction technique**, Mariani M. J., Di Ruscio A., Notaro V., Iess L., *Journal of Deep Space Exploration*, 2018, Vol. 5, p. 115-123, doi:10.15982/j.issn.2095-7777.2018.02.002

**SPOKEN  
LANGUAGES**

Mother tongue : **Italian**

Other languages:

**English**

- Listening: C1
- Speaking: C1
- Writing: C1

**French**

- Listening: C1
- Speaking: C1
- Writing: C1

**ORGANISATIONAL/  
MANAGERIAL  
SKILLS**

During my university years I participated to a series of group projects such as the realization of a mini-rocket, the design of a LEO satellite by using the Italian Space Agency’s Concurrent Design Facility, etc. From these experiences I learnt the importance of team work and cooperation in the realization of a complex system and the fundamental role of organization in order to efficiently solve problems within strict deadlines.

**TECHNICAL  
SKILLS**

I hold a thorough knowledge of the state-of-the-art deep space tracking systems and of the current methodologies and techniques for the solution of the orbit determination problem for an interplanetary mission. I have learnt the design of a space structure by means of the finite element method with Adina software. I am confident with the following programming languages and editing softwares:

Numerical Analysis:

- Python, MATLAB

Desktop Editing and Productivity Softwares:

- Vim,
- T<sub>E</sub>X (L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>),
- Microsoft Office, iWork, Google Docs

Operating Systems:

- Apple OS X, Microsoft Windows, Ubuntu and other Linux distributions

**AWARDS**

**NASA Space App Challenge 2015**

- Global winner of the international competition organized by NASA with the project: **CROPP, Cultures Risks Observation and Prevention Platform.**

Sapienza University collaboration fellowship

- For two consecutive years (2014 and 2015) I won a merit-based grant for my cooperation with the university library system.