MAURO DI BENEDETTO

from March 2014

Space Projects Manager

Instrument/Experiment manager for the 3GM investigation of the ESA/JUICE mission:

- Definition of scientific and instrument performance requirements
- Full cycle of RF instruments development (IPRR, ICR, IPDR & ICDR, IFAR)
- Technical analyses and programmatic/financial reviews
- Deep space operations definition for gravity and occultation experiments
- Project proposal writing
- Document configuration management

Business or sector Project Control, Space missions

from 2014 to 2015

Project Engineer

"HERO – High performance time & frequency link" - ESA/ESTEC ITT AO17583/13/NL/HB

- Review of scientific requirements for the STE-Quest mission
- Definition of microwave links specifications
- Deep space atomic clocks
- Numerical simulations

Business or sector R&D, Space missions

from 2010 to 2014

System Engineer / Post Doc researcher

Sapienza, University of Rome, Radio Science Lab, 18, via Eudossiana, 00084 Rome, Italy

- flight dynamics and orbit determination for interplanetary missions
- software tools development (Python/Shell, FORTRAN)
  - o mission analysis
  - o tools for automated statistical data analysis
- architectural design of advanced tracking systems for spacecraft navigation (Doppler, ranging and DDOR)
- error budget analysis and modeling

Partially funded by ESA/ESOC ITT AO/1-6221/09/F/MOS - "ASTRA - Interdisciplinary study on enhancement of end-to-end accuracy for spacecraft tracking techniques"

Business or sector R&D, Spacecraft Communications, Tracking systems and data analysis

from 2009 to 2010

Project Engineer

ESA/ESTEC ITT AO/1-5915/08/NL/AF - Radiocomm signals: "A new way of probing the surface of planets"

- architectural design of a mission analysis software simulator (Matlab)
- Ka band link and noise budget modeling
- software debugging, testing and validation

Business or sector Spacecraft communications

from 2006 to 2011

PhD Student and Research assistant

Sapienza, University of Rome, Radio Science Lab, 18, via Eudossiana, 00084 Rome, Italy

- orbit determination of the Cassini spacecraft (in collaboration with Cassini FD team):
  - o modeling and estimation of the non-gravitational accelerations

     o   software development for data analysis

     o   data reduction and calibration (batch, sequential and multi-arc filtering)

     o   simulations of planetary geodesy experiments

Business or sector R&D, Orbit determination, Planetary Geodesy and Physics

EDUCATION AND TRAINING

2016   **International School of Space Science: "Planetary Interiors", L'Aquila, Italy (September 12-16)**
Gran Sasso Science Institute, Viale Francesco Crispi 7, 67100 L'Aquila, Italy

- Observational Background - Methods and Measurements – Instrumentation and Missions

2007-2011   **PhD in Aerospace Engineering - "The non-gravitational accelerations of the Cassini spacecraft and the nature of the Pioneer anomaly"**
Sapienza, University of Rome, 8, via Eudossiana, 00084 Rome, Italy

- Orbit Determination – Data reduction and filtering – Fundamental physics

2010   **ISAEA (International School of Aerospace Engineering Applications) 1st edition: "Estimation Theory", Bertinoro, Italy (July, 12-16)**

- Kalman filtering – Inertial navigation

2006   **MSc in Aerospace Engineering - Thesis: "Pioneer anomaly detectability with planetary probe measurements"**
Sapienza, University of Rome, 8, via Eudossiana, 00084 Rome, Italy

- Application of general perturbative methods (Lagrange/Gauss equations) and special techniques (Encke method) to planetary orbiters - Spacecraft trajectory propagation

PERSONAL SKILLS

Mother tongue(s)   Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
French	A1	A2	A2	A1	A2
Portuguese	B1	A2	B1	A2	A2

Communication skills
- Excellent on composing presentations for engineering and scientific audience
- Very confident on speaking in public
- Excellent on technical writing

Computer skills
- FORTRAN 77/90 - Matlab - C++ - Shell and Python scripting - Orbit Determination Programs (DPTraj and MONTE, of JPL property) - MS Office - LaTeX - Gnuplot - Spice/NAIF - PHP - MySQL - Unix/Linux - Windows and Mac OS platforms

Other skills
- Musician, Free climber, Martial arts and swimming teacher

Driving license
- Car: B Motorbike: A3

ADDITIONAL INFORMATION

Publications	▪	P. Cappuccio, A. Hickey, D. Durante, M. Di Benedetto, L. Iess, C. Plainaki, A. Milillo and A. Mura "Ganymede's gravity, rotational state and exospheric density from JUICE's 3GM experiment simulation", Journal of Planetary and Space Science (in press)
	▪	M. Di Benedetto, L. Imperi, D. Durante, M. Dougherty, L. Iess, V. Notaro, P. Racioppa, "Augmenting NASA Europa Clipper by a small probe: Europa Tomography Probe (ETP) mission concept, Acta Astronautica 165 (2019) 211-218
	▪	V. Notaro, M. Di Benedetto, G. Colasurdo, D. Durante, P. Gaudenzi, L. Imperi, M. J. Mariani, A. Marotta, G. Palermo, L. Pollice, P. Racioppa, A. Zavoli, L. Iess, "Europa Tomography Probe (ETP) Mission Feasibility – Spacecraft Design", 67th International Astronautical Congress, Guadalajara, Mexico, 26-30 September 2016
	▪	L. Iess, M. Di Benedetto, N. James, M. Mercolino, L. Simone, P. Tortora, "ASTRA: interdisciplinary study for enhancement of the end-to-end accuracy for spacecraft tracking techniques", Acta Astronautica, Volume 94, (2014) 699-707
	▪	L. Iess, M. Di Benedetto, M. Marabucci, P. Racioppa, "Improved Doppler tracking systems for deep space navigation", 23rd ISSFD, Oct 29 to Nov 5, 2012, Pasadena
	▪	S. E. Centuori, F. E. Aleman, M. Di Benedetto, L. Iess, A. Graziani, A. Palli, N. Pierdicca, R. P. Cerdeira, P. Racioppa, D. T. Sanchez, P. Tortora, 'RC-SIM: Radiocomm signals for retrieval of planetary geophysical parameters' IAC-11.A3.5.6, 62nd International Astronautical Congress, Cape Town, SA, 3-7 October 2011
	▪	M. Di Benedetto, L. Iess, D. C. Roth, "The non-gravitational accelerations of the Cassini spacecraft", ISSFD 2009, Toulouse
	▪	N. J. Rappaport, R. Jacobson, L. Iess, P. Racioppa, J.W. Armstrong, S.W. Asmar, D.J. Stevenson, P. Tortora, M. Di Benedetto, A. Graziani, R. Meriggiola, "The gravity field of Titan", AGU 2008
	▪	N. J. Rappaport, L. Iess, J. Wahr, J. I. Lunine, J. W. Armstrong, S. W. Asmar, P. Tortora, M. Di Benedetto and P. Racioppa, "Can Cassini detect a subsurface ocean in Titan from gravity measurements?", Icarus, Volume 194, Issue 2, April 2008, pp. 711-720
	▪	N. J. Rappaport, L. Iess, P. Tortora J. Wahr, J. I. Lunine, R. Mackenzie, J. W. Armstrong, S. W. Asmar, A. Ardito, M. Di Benedetto and P. Racioppa, "The Gravity Science Analysis of Cassini Flybys T11 and T22 and Future Work", EOS Trans. AGU,88(52), Fall Meet. Suppl 2007.
	▪	S. Asmar, N. Rappaport, L. Iess, J. Wahr, J. Lunine, J. W. Armstrong, P. Tortora, M. Di Benedetto, P. Racioppa, R. MacKenzie, R. Jacobson: "The search for Titan's ocean", 39 DPS Meeting (AAS), Orlando (FL), 7-12 Oct. 2007
	▪	L. Iess, J.W. Armstrong, S. W. Asmar, M. Di Benedetto, A. Graziani, R. Mackenzie, P. Racioppa, N. Rappaport, P. Tortora, "The Determination of Titan Gravity Field from Doppler Tracking of the Cassini Spacecraft", Proceedings of the XX International Symposium on Space Flight Dynamics (ISSFD), September 24-28, 2007, Annapolis, MD, USA
Honors and awards	▪	NASA Group Achievement award to Cassini Radio Science team for outstanding contributions leading to the success of the Cassini Radio Science investigations at Saturn