

MANUELA MARABUCCI

PERSONAL INFORMATION

birthday Rome, January 10th, 1984
email manuela.marabucci@gmail.com
phone (+39) 347 40 61 169
address Via sorelle Tetrizzini 40, 00139 - Rome

WORK EXPERIENCE

May 2010 - Present Research assistant
SAPIENZA, UNIVERSITÀ DI ROMA
DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

*BepiColombo
radio science
experiment
(MORE)*

- Numerical simulations of the radio science experiment of the mission BepiColombo (using JPL's orbit determination programs ODP and MONTE).
- Estimation processes for retrieving Mercury's gravity field and spacecraft trajectory by means of Doppler and range observables.
- Experiment documentation management and participation in conferences, workshops and progress meetings with ASI, ESA and industrial partners.

Ref: Prof. Luciano IESS · (+39) 44 585 336 · luciano.iess@uniroma1.it

Jun. 2012 - Aug. 2012 Collaboration
DLR (BERLIN)

*BepiColombo
laser altimeter
and radio science
experiment*

Collaboration with BepiColombo laser altimeter team in the project of the PhD thesis.

- Software development for including laser altimeter crossover observables in the orbit determination process, together with Doppler and range measurements.
- Numerical simulations of the BepiColombo radio science experiment with Doppler, range and crossover observables.

Ref: Dr. Hauke HUSSMANN · +49 (0)30 67055 315 · hauke.hussmann@dlr.de

Apr. 2010 - Feb. 2012 Project Engineer (ESA ITT)
SAPIENZA, UNIVERSITÀ DI ROMA

*ASTRA
(ESA ITT)*

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ASTRA (An interdisciplinary study on enhancement of end-to-end Accuracy for Spacecraft TRacking techniques) is a study funded by ESA's General Studies Programme, and carried out with ALMA Space, BAE Systems and Thales Alenia Space - Italy.

- Review of existing radio-metric systems and observables.
- Doppler, range and DDOR end-to-end error budget consolidation and identification of the main noise sources.
- Outline of possible solutions enabling radio tracking accuracy improvement.

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Dec 2008 - May 2010 Short term contracts
SAPIENZA, UNIVERSITÀ DI ROMA

*Radio science
experiment*

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

- Numerical simulations for precision orbit determination of interplanetary probes.
- Setup analysis for the BepiColombo radio science experiment.

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EDUCATION

- Oct. 2009-Present* SAPIENZA, UNIVERSITÀ DI ROMA
(Discussion foreseen between September and December 2013)
- PhD* *Aeronautic and Space Technologies* · Faculty of Engineering
· SUBJECTS: Orbit determination, estimation processes, data analysis, interplanetary probe tracking, gravity field estimation.
· THESIS: The determination of the Hermean gravity and topography from radio science and laser altimeter data of the mission BepiColombo.
· DESCRIPTION: The thesis is about the use of laser altimetric crossover observables in the orbit determination process, in the frame of the BepiColombo radio science experiment. Numerical simulations have been carried out with the JPL's orbit determination program (ODP), in order to evaluate the crossover contribution in the trajectory reconstruction when accurate radio measurements are provided, and to devise the best strategy to retrieve Mercury's gravity field and topography. The software used was the JPL's ODP, exploiting a batch sequential filter.
· ADVISORS: Prof. Luciano IESS
- Sep. 2005-Oct. 2008* SAPIENZA, UNIVERSITÀ DI ROMA
- Master of science* *Aeronautical Engineering (110/110)* · School of Aerospace Engineering
· SUBJECTS: Interplanetary trajectory, orbit determination, space mission project, astrodynamics, space environment and instrumentation.
· THESIS: Determination of Mercury's tidal deformation by means of Doppler data with BepiColombo mission.
· DESCRIPTION: The thesis is about the estimation of Mercury's tidal deformation (Love's number) and gravity field, by means of radio observables analysis, in the context of the BepiColombo radio science experiment. The software used was the JPL's ODP, exploiting a multiarc approach.
· ADVISORS: Prof. Luciano IESS
- Sep. 2002-Sep. 2005* SAPIENZA, UNIVERSITÀ DI ROMA
- Bachelor of science* *Aerospace Engineering (103/110)* · Faculty of Engineering
· SUBJECTS: Physics, maths, aerospace structures and propulsion basics.
· THESIS: Solar sail effect on spacecraft motion.
· DESCRIPTION: The thesis is a study of solar sails and an analysis of the effects on the spacecraft motion.
· ADVISORS: Prof. Nicola DE DIVITIS

COMPUTER SKILLS

- Basic* MONTE (Mission analysis and Operational Navigation Toolkit Environment)
Python
- Intermediate* Matlab
L^AT_EX
Linux
Unix
- Advanced* ODP (Orbit Determination Program)
Fortran
Naif/Spice
Bash
Windows
Microsoft Office

OTHER INFORMATION

<i>Job-related skills</i>	<ul style="list-style-type: none">· Strong experience in managing documentation of a scientific experiment on board space mission, and interfacing with ASI, ESA and industrial partners, participation in several scientific and programmatic meetings and workshops, and oral presentations on experiment status, scientific results and possible issues.· Excellent knowledge of orbit determination and estimation processes in general, as main topic of my thesis and PhD studies.
<i>Social and communication skills</i>	<ul style="list-style-type: none">· Excellent ability to get on with the others and to work in teams, achieved through years of work in the university.· Excellent ability to work and live in a multicultural environment, gained through work and study experiences abroad.
<i>Organizational / managerial skills</i>	<ul style="list-style-type: none">· Excellent ability to manage my own work and the work of the team, whenever necessary, acquired during my working experience at the university.· Good experience in managing groups and in organizing events, achieved through voluntary activities and sport teaching experience.
<i>Conferences and meetings</i>	<ul style="list-style-type: none">· Attendance and oral presentations to several scientific conferences (20th AAS/AIAA Space Flight Mechanics Meeting, 22th ISSFD, EGU 2011 - 2012, IAC 2012, EPSC 2010), and to programmatic meetings and workshops (MORE progress meetings, BepiColombo science working groups).
<i>Languages</i>	ITALIAN · <i>Mothertongue</i> ENGLISH · <i>Fluent</i>

May 13th, 2013