

## PERSONAL INFORMATIONS



## Simioni Emanuele

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✉ emanuele.simioni@inaf.it

Sex Male | Date of Birth 21/10/1979 | Nationality Italian

## OCCUPATION

## Technologist

## PROFESSIONAL EXPERIENCE

01/07/2017–nowadays

## TD Technologist III Level III

INAF-OAPD Padova Astronomic Observatory (Italy)

fellowship ASI-INAF

**“Progettazione e sviluppo del software per la generazione di Digital Terrain Models e supporto tecnico ai progetti SIMBIO-SYS, CaSSIS e accordo ASI-NASA su Esplorazione di Luna-Marte\_asteroidi” (supervisor G.Cremonese)**

(Rif D.D. 46/2017)

01/07/2015–01/07/2017

## Post -Doc

CNR-IFN Istituto di Fotonica e Nanotecnologie, Padova (Italia)

Postdoc Senior Research fellowship ASI-INAF IFN for BepiColombo (Phase B2/C WP1130)

**“Attività di analisi dei dati di calibrazione della stereo-camera STC” (supervisor Vania .Da Deppo)**

(126.247.AR110)

01/03/2015–30/06/2015

## Scholarship

INAF-OAPD Padova Astronomic Observatory (Italy)

**“Supporto alla simulazione di un vapor plume di Europa e osservabilità con Janus” (supervisor G.Cremonese)**

(Rif. D.D. n. 2/2015)

15/02/2013–14/02/2015

## Post -Doc

CNR-IFN Istituto di Fotonica e Nanotecnologie, Padova (Italia)

Postdoc Research Fellowship ASI-INAF IFN for BepiColombo Phebus [PHEBUS]

**“Attività di calibrazione per hardware spaziale”(supervisor V. Da Deppo)**

(126.247.AR71)

01/02/2011–31/01/2013

## Post -Doc

CNR-IFN Istituto di Fotonica e Nanotecnologie, Padova (Italia)

Postdoc Research fellowship ASI-INAF IFN for BepiColombo STC

**“Sviluppo di algoritmi Snake based per la ricostruzione tridimensionale di superfici planetarie**

**e loro applicazioni in laboratorio” (supervisore V. Da Deppo)**  
(126.247.AR48)

01/06/2010–31/01/2011 **Co.Co.Co**  
CISAS Centro Aerospaziale di Padova, Padova (Italia)  
Grant Co.Co.Co CISAS-ASI in the context of Rosetta Mission [OSIRIS]  
**“Ricostruzioni Tridimensionali Da Immagini Da Satellite”(supervisore G.Naletto)**  
(Prot. 265, 26/09/2010)

01/03/2010–01/06/2010 **Grant**  
DEI-UNIPD - Dipartimento Ingegneria Informazione, Padova (Italia)  
Borsa di studio ASI-INAf DEI in the context of BepiColombo mission [SIMBIO-SYS/STC]  
**“Ricostruzioni 3D da immagini stereoscopiche da satellite”(supervisore G.Naletto)**  
(n. 157,26/2/2010)

01/12/2005–01/01/2007 **Consultant**  
3DEveryWhere (Spin-Off del DEI)  
Software developer in C++ for tools in photogrammetric field: medical, sport, cultural heritage.

## EDUCATION

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01/01/2007–11/10/2011 **PhD - Astronautics and Satellite Science (ASS)**  
  
CISAS(Interdepartmental Centre Space Studies and Activities) “G.Colombo”, Padova.  
Thesis entitled:  
*“3d Analysis of the stereoscopic performance of the stereo camera (STC) for the BepiColombo mission: a new method for 3D reconstruction”,*  
under the supervision of Prof. G.Naletto (Information Department, Padova, Italy) and Dr G.Cremonese (National institute for Astrophysics).  
Discussion: 18/04/2011.

11/10/1999–11/10/2004 **MSC Degree in Telecommunications Engineering**  
University of Padua, Italy. from the Department of Electronic and Informatics,  
Padova. Degree thesis entitled:  
*“3D surface reconstruction from images and applications”*  
under the supervision of Prof. G.M. Cortelazzo (Information Department, Padova, Italy).  
Final Grade: 94/100  
Professional qualification: 5/1/2005; discussion 20/12/2004.

## PERSONAL SKILLS

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Mother tongue Italian

Others

UNDERSTANDING		SPEAKING		WRITTEN PRODUCTION
Listening	Reading	Interaction	Oral production	

English	B2	C1	C1	B2	B2
French	A2	A2	A2	A2	A1

**Digital Skills**
**Programming:**

- MATLAB (native)
- C/C++ (Win32/64) (~ 13 years)
- IDL (~9 years)
- C# (~4 years)
- Basis knowledge: *Python, Java, Amos, Pascal, Assembly, Gauss*

**Graphics:**

- Blender, MeshLab, GIMP
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**Basic knowledge of:**

- ARCGIS, Autocad, Inventor, ZEMAX, ASP (Stereo Pipeline)

**Excellent knowledge of:**

- Windows-MS,
- Visual Studio, Eclipse
- Agisoft PhotoScan
- SPICE Toolkit Software

## ADDITIONAL INFORMATIONS

**Research interests**

My research activities within the imaging and 3D models field encompass image analysis and passive 3D reconstruction techniques (stereo, silhouette, shading based) in particular interested to the solution of the Matching Problem.

The application field of these topics is the generation of Digital Terrain Model from satellite images and geometrical imaging methods for the astronomic investigations both in the science context of and in instrumental one.

- 3D photogrammetric reconstruction methods applied in polyhedral fields;
- Satellite Optics, Design and instrument calibration.
- Matlab programming oriented to Astronomic and Geological geometric and topologic analysis of 3D models of planetary and minor body surfaces;
- Stereographic video editing and mounting for 3D-Television or VR glasses (in the context of public outreach)

**Research, responsibility, fund management, leadership positions**

Specific professional experiences:

- **Co-Investigator of ESA/BepiColombo/ SYMBIOSIS**  
PI: Cremonese Gabriele (INAF/OAPD, Padova, Italy)
- **Associate Scientist of ESA/ExoMars/CaSSIS**

PI: Thomas, Prof. Nicolas (University of Bern, Switzerland)

- **Assistant Scientist, of ESA/Rosetta/OSIRIS**

PI: Sierks, Dr. Holger (Max Planck Institute, Goettingen, Germany)

- **Associate Scientist, of ESA/JUICE/JANUS**

PI: Palumbo, Prof. Pasquale (University of Naples, Italy)

**Member of MAPS:** Modelling and Analysis of Planetary Surfaces:  
interdisciplinary research group (Padova, Italy)

*Analytical description of the tasks and responsibilities of the missions mentioned above.*

## **SIMBIO-SYS**

*2015-2018 Co-Investigator of SIMBIO-SYS (BepiColombo Mission)*

- **Person in charge of STC calibration**

- Design activities of the In-Flight dark calibration of STC
- Design activities of the Calibration pipeline of STC
- Design activities of Radiometric Calibration through interactions with CNR-IFN and Leonardo S.p.A.
- Definition of the Windowing of SRC and support to the drawing up of the User Manual of the instrument.
- Data analysis of the Calibration Session of STC through interactions with Leonardo S.p.A, in particular:
  - Definition of Dark Calibration key data products such as, FPN, DSNU di STC.
  - Definition of geometric distortion of the channel.

- **Responsible for STC telemetries.**

- Support to NECP (Near Earth Commissioning Phase) of SIMBIO-SYS at ESOC (Darmstadt, Frankfurt)
  - Beta Tester for ESAC Procedure Builder (Telemetry Tool for BepiColombo).
  - Design of the Flight Operation Procedure and Timelines for the NECP (Near Earth Commissioning Phase) di STC.
  - Support and data analysis for the on board software of SIMBIO-SYS at ESOC centre (Darmstadt, Frankfurt)
- Support to the design of the SIMBIO-SYS Spice-Kernels, Operations, and Data Handling.

*2009-2015 Associated scientist*

- Support and data analysis for Detector Behaviour campaign for STC detector at ESA (ESTEC), Noordwijk
- Support and data analysis for the campaigns of the STC Calibration at Selex ES (nowadays Leonardo).
- Support and data analysis for the campaigns of the STC Pre-Calibration (optic, radiometric, geometric) at Selex ES (nowadays Leonardo).
- Design activities and assembly of the validation setup for the STC instrument at LUXOR laboratories and Selex ES (today Leonardo).

**CASSIS 2015-2018**

*Associated scientist di CaSSIS / Exo-Mars2016*

- **Responsible for the 3DPD reconstruction pipeline, stereo image reconstruction software of the Padua Observatory.**
- Member of the operations team of the instrument.
- Support to the calibration of the instrument (visiting scientist, in summer 2015, at the University of Berne).
- Design and coding activities for tools to mosaic images of the instrument.
- Design activity of the CaSSIS DTMs Archiving System, based at the Padua Observatory, through international collaborations.

**OSIRIS 2015-2018**

*Assistant scientist di OSIRIS / Rosetta*

- Design and coding activities of an algorithm for the detection and measurement of dust grains in the WAC and NAC images of the CG67P comet as part of the Rosetta Mission
- Design and coding activities of a software for the analysis of the features through stereographic projections of minor bodies applied to the Phobos satellite in order to study the possible origins of the body through the correlation between impact and distribution craters and radial features. The software was then applied to CG67P.
- Matlab design and coding activities for the definition of stratigraphic plans on the CG79P comet through stereographic analysis applied to the gravitational model of the body and for the purpose of defining the origin of the comet.
- Support for the geomorphological analyses from CG67P image and 3D data using Computer Vision techniques.

**JUICE 2015-2018**

*Associated scientist al Team di Janus / Juice.*

Title : <b>SIMBIO-SYS STC Calibration: Geometrical Distortion</b>	
Authors : <b>Emanuele Simioni</b> , Vania Da Deppo, Cristina Re, Alessandra Slemer , Maria Teresa Capria, Iacopo Fikai Veltroni, Michele Dami , Donato Borrelli , Leonardo Tommasi , Mugnuolo Raffaele, Marilena Amoroso, Francesco Longo, Gabriele Cremonese	
Role played: Analysis and data reduction of the geometric calibration data of the channel STC (SIMBIO-SYS) and medialization by Rational Function Models (RFM) of the distortion and its behaviour respect with the temperature.	
Journal: Review of Scientific Instruments	
Identification code (ISSN)	034-6748
Publication year: submitted 19/07/2018	
Impact Factor Journal	1.515
Quotes	0

Title : <b>Performance evaluation of the SIMBIO-SYS Stereo Imaging Channel on board BepiColombo/ESA spacecraft. Measurement.</b>	
Authors : Alessandra Slemer, <b>Emanuele Simioni</b> , V. Da Deppo, Michele Zusi, Cristina Re, Alice Lucchetti, Michele Dami, Donato Borrelli, Iacopo Fikai Veltroni, Maria Teresa Capria, G Cremonese	
Role played: Contribution to the data analysis and the statistic evaluation around the observation strategy and graphic design Supervision.	
Journal: Measurement	
Identification code (DOI)	10.1016/j.measurement.2018.12.044
Publication year: 2018	
Impact Factor Journal	2.218
Quotes	0

Title: <b>Phobos MRO/CRISM visible and near-infrared (0.5–2.5 <math>\mu\text{m}</math>) spectral modelling</b>	
Authors: Maurizio Pajola , Ted Roush , Cristina Dalle Ore , Giuseppe A. Marzo, <b>Emanuele Simioni</b>	
Role-played: Alignment of different wavelengths images and support to Clustering and to the correction of the images respect incidence and emission angles.	
Journal :	Planetary and Space Science
Identification code (ISSN)	0032-0633
Publication year 2018	
Impact Factor Journal	1.892

Quotes	1
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<b>Title: Post-perihelion photometry of dust grains in the coma of 67P Churyumov-Gerasimenko</b>	
Authors: E. Frattin G. Cremonese <b>E. Simioni</b> I. Bertini M. Lazzarin T. Ott E. Drolshagen F. La Forgia H. Sierks C. Barbieri P. Lamy R. Rodrigo D. Koschny H. Rickman H. U. Keller J. Agarwal M. F. A'Hearn M. A. Barucci The Osiris Team	
Role-played: codes development of the automatic recognizing (through pattern recognition based on dust traces medialization) of the dust in the environment of the comet CG67P for mission Rosetta.	
Journal :	Monthly Notices of the Royal Astronomical Society
Identification code (ISSN)	1365-2966
Publication year 2017	
Impact Factor Journal	5.194
Quotes	2

<b>Title: A three-dimensional modelling of the layered structure of comet 67P/Churyumov-Gerasimenko</b>	
Authors: L Penasa M Massironi G Naletto <b>E Simioni</b> S Ferrari M Pajola A Lucchetti F Preusker F Scholten L Jorda R Gaskell F Ferri F Marzari The Osiris Team	
Role-played: support to modelling of the “morphological fields” of the 3D model of the comet in relation to its gravitational field. The work allows defining the layering of the body proving its physical basis, not only at a statistical level.	
Journal :	Monthly Notices of the Royal Astronomical Society
Identification code (ISSN)	1365-2966
Publication year 2017	
Impact Factor Journal	5.194
Quotes	4

<b>Title: The pristine interior of comet 67P revealed by the combined Aswan outburst and cliff collapse</b>	
Authors: Pajola, M. and Höfner, S. and Vincent, J. B. and Ockay, N. and Scholten, F. and Preusker, F. and Mottola, S. and Naletto, G. and Fornasier, S. and Lowry, S.C. and Feller, C. and Hasselmann, P. H. and Güttler, C. and Tubiana, C. and Sierks, H. and Barbieri, C. and Lamy, P. and Rodrigo, R. and Koschny, D. and Rickman, H. and Keller, H. U. and Agarwal, J. and A'Hearn, M. F. and Barucci, M. A. and Bertaux, J.-L. and Bertini, I. and Besse, S. and Boudreault, S. and Cremonese, G. and Da Deppo, V. and Davidsson, B. and Debei, S. and De Cecco, M. and Deller, J. and Deshpriya, J. D. P. and El-Maarry, M. R. and Ferrari, S. and Ferri, F. and Fulle, M. and Groussin,	

O. and Gutierrez, P. and Hofmann, M. and Hviid, S. F. and Ip, W.-H. and Jorda, L. and Knollenberg, J. and Kovacs, G. and Kramm, J. R. and Kührt, E. and Küppers, M. and Lara, L. M. and Lin, Z.-Y. and Lazzarin, M. and Lucchetti, A. and Lopez Moreno, J. J. and Marzari, F. and Massironi, M. and Michalik, H. and Penasa, L. and Pommerol, A. and <b>Simioni, E.</b> and Thomas, N. and Toth, I. and Baratti, E.	
Role played: Support to the statistical analysis of the boulders counting.	
Journal :	Nature Astronomy
Identification code (ISSN)	2397-3366
Publication year 2017	
Impact Factor Journal	N/A
Quotes	32

<b>Title: Effects of image compression and illumination on digital terrain models for the stereo camera of the Bepicolombo mission</b>	
Authors: C.Re, <b>E.Simioni</b> , G.Cremonese, R.Roncella, G.Forlani, Y.Langevin, V.Da Deppo, G.Naletto, G.Salemi	
Role-played: Designer of the validation setup of the instrument. Through this set-up was possible to acquire images stereo despite the instrument have divergent optical paths and requires (in nominal conditions) acquisition distance greater than 400 km. After having followed the project from the beginning, contacting the calibration activities at LUXOR laboratories and at Leonardo S.p.A, I developed the code for the images analysis and reduction to define all the parameters associated to illumination and compression.	
Journal :	Planetary and Space Science
Identification code (ISSN)	0032-0633
Publication year 2016	
Impact Factor Journal	1.892
Quotes	2

<b>Title: Photometry of dust grains of comet 67p and connection with nucleus regions</b>	
Authors: Cremonese, G.; <b>Simioni, E.</b> ; Ragazzoni, R.; Bertini, I.; La Forgia, F.; Pajola, M.; Oklay, N.; Fornasier, S.; Lazzarin, M.; Lucchetti, A.; Sierks, H.; Barbieri, C.; The Osiris Team	
Role-played: development of codes for the tracking (recognition feature based) of the dust in the environment of comet CG67P in the context of mission Rosetta.	
Journal :	Astronomy & Astrophysics
Identification code (ISSN)	0004-6361
Publication year 2016	



Impact Factor Journal	5.185
Quotes	7

Title: <b>Phobos grooves and impact craters: a stereographic analysis.</b>	
Authors: <b>Emanuele Simioni</b> , Maurizio Pajola, Matteo Massironi, Gabriele Cremonese	
Role played: Development of the code for the study of the attitude of the grooves in different reference system with the scope to define the radiality of these lineaments and so their origin.	
Journal :	Icarus
Identification code (ISSN)	0019-1035
Publication year 2015	
Impact Factor Journal	2.981
Quotes	3

Title: <b>Geomorphology and spectrophotometry of Philae's landing site on comet 67P/Churyumov-Gerasimenko.</b>	
Authors: La Forgia F., Giacomini L., Lazzarin M., Massironi M., Oklay N., Scholten F., Pajola M., Bertini I., Cremonese G., Barbieri C., Naletto G., <b>Simioni E.</b> , Preusker F., Thomas N., Sierks H., Lamy P., Rodrigo R., The Osiris Team	
Role-played: Support to the use of the Spice Kernel and to the development of an IDL code for the visualization of body images (WAC and NAC cameras of OSIRIS) and the associated 3d model.	
Journal :	Astronomy & Astrophysics
Identification code (ISSN)	0004-6361
Publication year 2015	
Impact Factor Journal	5.185
Quotes	25

Title: <b>Two independent and primitive envelopes of the bilobate nucleus of comet 67P</b>	
Authors: Matteo Massironi, <b>Emanuele Simioni</b> , Francesco Marzari, Gabriele Cremonese, The Osiris Team	
Role played:	

Development of codes for the measurements throw stereo plots (geomorphological techniques) of the attitude of the layers measured on the 3d photo clinometric model of the cometary body. The comparison between these attitudes and the ones originated by different gravitational models allowed to deduce the origin of these features and, in particular, to confirm that the geomorphological features present on the comet are more coherent with a double bodies model (united in a gentle collision) despite with a unique body.	
Journal :	Nature
Identification code (ISSN)	0028-0836
Publication year	2015
Impact Factor Journal	44.958
Quotes	74

<b>Title: Size-frequency distribution of boulders <math>\geq</math> 7 m on comet 67P/Churyumov-Gerasimenko</b>	
Authors: Pajola, Maurizio; Vincent, Jean-Baptiste; Güttler, Carsten; Lee, Jui-Chi; Bertini, Ivano; Massironi, Matteo; <b>Simioni, Emanuele</b> ; Marzari, Francesco; Giacomini, Lorenza; Lucchetti, Alice; Barbieri, Cesare; Cremonese, Gabriele; Naletto, Giampiero; Pommerol, Antoine; The Osiris Team	
Role-played: Support to statistical data analysis.	
Journal :	Astronomy & Astrophysics
Identification code (ISSN)	0004-6361
Publication year	2015
Impact Factor Journal	5.185
Quotes	56

<b>Title: X-ray shape-from-silhouette for three-dimensional modelling applied to ancient metallic handworks</b>	
Authors: Luca Poletto, Irene Calliari, Filippo Ratti, <b>Emanuele Simioni</b>	
Role played: Development of codes for 3D reconstruction by X-rays images based on algorithm of shape form silhouette used in the archaeological field for the restoration of particularly oxidized metal objects	
Journal :	Journal of Cultural Heritage
Identification code (ISSN)	1296-2074
Publication year	2013
Impact Factor Journal	1.111

Quotes	0
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<b>Title: Hydrocode simulations of the largest crater on asteroid Lutetia</b>	
Authors: Cremonese, G.; Martellato, E.; Marzari, F.; Kuhrt, E.; Scholten, F.; Preusker, F.; Wünnemann, K.; Borin, P.; Massironi, M.; <b>Simioni, E.</b> ; Ip, W.; The Osiris Team	
Role-played: Support to the alignment a measurement (by Matlab codes) of the surface of the minor body.	
Journal :	Planetary and Space Science
Identification code (ISSN)	0032-0633
Publication year 2012	
Impact Factor Journal	1.892
Quotes	11

<b>Title: Three-dimensional modelling using x-ray shape-from-silhouette</b>	
Authors: <b>Emanuele Simioni</b> , Filippo Ratti, Irene Calliari, and Luca Poletto	
Role-played: Development of codes for 3D reconstruction by X-rays images based on algorithm of shape form silhouette used in the archaeological field for the restoration of particularly oxidized metal objects. Design of a system of calibration low cost for the generation of convex 3d models through X-rays images a 360°.	
Journal :	Applied Optics
Identification code (ISSN)	2155-3165
Publication year 2011	
Impact Factor Journal	1.791
Quotes	2

<b>Title: A new stereo algorithm based on snakes</b>	
Authors: <b>Simioni Emanuele</b> ; Naletto Giampiero; Forlani Gianfranco; Cremonese Gabriele; Da Deppo Vania; Massironi Matteo; Segato Elisa.	
Role played: Definition, study and development of a greedy algorithm for 3D reconstruction based on deformable models in order to optimize synchronously the greatest number of sources of 3D information, be they stereoscopic, photo clinometric or modelling of the target.	
Journal :	

Photogrammetric Engineering & Remote Sensing	
Identification code (ISSN)	0099-1112
Publication year 2011	
Impact Factor Journal	3.15
Quotes	7

<b>Title: Analysis of Steins Cratering History Using the OSIRIS/ROSETTA Images.</b>	
Authors: Marchi, Simone; Barbieri, C.; Casotto, S.; Cremonese, G.; Da Deppo, V.; Ferri, F.; Lazzarin, M.; Magrin, S.; Martellato, E.; Marzari, F.; Mottola, S.; Simioni, E.; OSIRIS Team	
Role played:  Analysis of the first stereo images of the instrument and 3D modelling of the body using shape from silhouette algorithms.	
Journal :	Bulletin of the American Astronomical Society
Identification code (ISSN)	0002-7537
Publication year 2009	
Impact Factor Journal	1
Quotes	0

<b>Title: The Stereo Camera on the Bepicolombo Esa/jaxa Mission: a Novel Approach.</b>	
Authors: Cremonese, Gabriele; Fantinel, Daniela; Giro, Enrico; Capria, Maria Teresa; da Deppo, Vania; Nalletto, Giampiero; Forlani, Gianfranco; Massironi, Matteo; Giacomini, Lorenza; Sgavetti, Maria; <b>Simioni, Emanuele</b> ; Debei, Stefano; Bettanini, Carlo; Zaccariotto, Mirco; Patrizia Borin, P.; Marinangeli, Lucia; Calamai, Luciano; Flamini, Enrico	
Role played:  Study of the preliminary observations strategies of the instrument and in particular the study of the necessary requirements for the choices of the detector, its pitch and acquisition strategy.	
Journal :	Advances in Geosciences
Identification code (ISSN)	1680-7340
Publication year 2009	
Impact Factor Journal	0.97
Quotes	16

**Journal Papers (List)****2018**

- **Simioni E. et al**  
"SIMBIO-SYS STC Calibration: Geometrical Distortion"  
Review of Scientific Instruments ,  
submitted 19/07/2018
- **Alessandra Slemer et al.**  
"Performance evaluation of the SIMBIO-SYS Stereo Imaging Channel on board BepiColombo/ESA spacecraft."  
Measurement. 2018
- **Pajola Maurizio, et al.**  
"Phobos MRO/CRISM visible and near-infrared (0.5–2.5  $\mu\text{m}$ ) spectral modelling."  
Planetary and Space Science 154 (2018): 63-71.

**2017**

- **Frattin, Elisa, et al**  
."Post-perihelion photometry of dust grains in the coma of 67P Churyumov–Gerasimenko."  
Monthly Notices of the Royal Astronomical Society 469.Suppl\_2 : S195-S203.(2017)
- **Penasa, L., et al.**  
"A three-dimensional modelling of the layered structure of comet 67P/Churyumov-Gerasimenko."  
Monthly Notices of the Royal Astronomical Society 469.Suppl\_2: S741-S754.(2017)
- **Pajola, M. et al.**  
"The pristine interior of comet 67P revealed by the combined Aswan outburst and cliff collapse."  
Nature Astronomy, 1(2017).
- **Re C., Simioni E. et al.**  
"Effects of image compression and illumination on digital terrain models for the stereo camera of the Bepicolombo mission."  
Planetary and space science 136 (2017): 1-14

**2016**

- **Cremonese G., Simioni E. et al**  
"Photometry of dust grains of comet 67p and connection with nucleus regions."  
Astronomy & Astrophysics 588 (2016): a59.

**2015**

- **Simioni E et al.**  
"Phobos grooves and impact craters: a stereographic analysis."  
Icarus 256 (2015): 90-100.
- **La Forgia F et al**  
"Geomorphology and spectrophotometry of Philae's landing site on comet 67P/Churyumov-Gerasimenko."  
Astronomy & Astrophysics 83 (2015): A41.

- *Massironi M., Simioni E. et al*  
 “Two independent and primitive envelopes of the bilobate nucleus of comet 67P.”  
 Nature 526.7573 (2015): 402-405.
- *Pajola, Maurizio, Simioni E. et al.*  
 “Size-frequency distribution of boulders  $\geq 7$  m on comet 67P/Churyumov-Gerasimenko.”  
 Astronomy & Astrophysics 583 (2015): A37.

### 2013

- *Poletto L et al.*  
 “X-ray shape-from-silhouette for three-dimensional modelling applied to ancient metallic handworks.”  
 Journal of Cultural Heritage 14.3 (2013): e169-e175.

### 2012

- *Cremonese G. et al*  
 “Hydrocode simulations of the largest crater on asteroid Lutetia.”  
 Planetary and Space Science 66.1 (2012): 147-154.

### 2011

- *Simioni E. et al.*  
 “Three-dimensional modelling using x-ray shape-from-silhouette.”  
 Applied optics 50.19 (2011): 3282-3288.
- *Simioni E. et al.*  
 “A new stereo algorithm based on snakes.”  
 Photogrammetric Engineering & Remote Sensing 77.5 (2011): 495-507.

### 2009

- *Marchi S. et al.*  
 Analysis of Steins Cratering History Using the OSIRIS/ROSETTA  
 Images. Bulletin of the American Astronomical Society 41 (2009): 558
- *G. Cremonese, et al*  
 The stereo camera on the BepiColombo ESA/JAXA mission: a novel approach  
 Advances in Geosciences, 15, 305, 2009

## SPIE and other publications

### 2018

1. **Simioni, E.** et al.  
 “SIMBIOSYS-STC ready for launch: a technical recap”  
*ICSO 2018, International Conference on Space Optics, 2018*
2. **Simioni, E.** et al.  
 “The pre-launch distortion definition of SIMBIO-SYS/STC stereo camera by rational function models.”  
*Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimetres Wave.* Vol. 10698.

International Society for Optics and Photonics, 2018.

3. Slemer, A., et al.

"A Mercury surface radiometric model for SIMBIO-SYS instrument suite on board of BepiColombo mission."

*Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimetres Wave*. Vol. 10698. International Society for Optics and Photonics, 2018.

4. Slemer, A., et **Simioni E.** et al.

"Performances of the SIMBIO-SYS Stereo Imaging Channel (STC) on board BepiColombo/ESA spacecraft"

*IEEE , Metrology Roma 2018*

## 2017

5. *Da Deppo V et al*

"Optical design and performance of the Stereoscopic Imaging Channel for the ESA BepiColombo mission."

*International Optical Design Conference. Optical Society of America, 2017.*

6. **E. Simioni, et al**

"A Photogrammetric Pipeline for the 3D Reconstruction of CaSSIS images on board ExoMars TGO."

*The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences 42 (2017): 133-139.*

## 2016

7. *Da Deppo V et al.*

Radiometric model for the stereo camera STC on board the BepiColombo ESA mission.

*SPIE Astronomical Telescopes+ Instrumentation (2016): 99111T-99111T.*

8. **Simioni E. et al.**

Geometrical distortion calibration of the stereo camera for the BepiColombo mission to Mercury.

*SPIE Astronomical Telescopes+ Instrumentation (2016): 990410-990410.*

9. *Re C, Simioni E. et al.*

Estimate of DTM Degradation due to Image Compression for the Stereo Camera of the Bepicolombo Mission.

*ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (2016): 471-478.*

10. **Simioni E. et al.**

"CMOS detectors: lessons learned during the STC stereo channel pre-flight calibration."

*International Conference on Space Optics—ICSO 2016. Vol. 10562. International Society for Optics and Photonics, 2017.*

## 2015

11. *Da Deppo V., Simioni E. et al.*

Distortion definition and correction in off-axis systems.

*SPIE Optical Systems Design (2015): 962634-962634.*

12. *Re C., Simioni E. et al*

DTM generation from STC-SIMBIO-SYS images.

*SPIE Optical Metrology (2015): 95280P-95280P.*

## 2014

13. **Simioni E. et al**

Preliminary LSF and MTF determination for the stereo camera of the BepiColombo mission.  
*SPIE Astronomical Telescopes+ Instrumentation (2014): 914341-914341.*

## 2012

14. *Naletto G. et al*  
Innovative optical setup for testing a stereo camera for space applications.  
*SPIE Astronomical Telescopes+ Instrumentation (2012): 84421M-84421M.*

## 2011

15. *Simioni E. et al*  
Shape-from-silhouette for three-dimensional reconstruction from x-ray radiography.  
*SPIE Optical Metrology (2011): 80840I-80840I.*

## 2010

16. *Simioni E. et al.*  
Three-dimensional reconstruction with x-ray shape-from-silhouette.  
*SPIE Optical Engineering+ Applications (2010): 78040X-78040X.*

## International Conference Abstract and Proceedings

## 2018

1. *Simioni, E. ,et al*  
3DPD application to the first CaSSIS DTMs ,  
*EPSC, Vol. 12, EPSC2018-380, 2018*
2. *Cambianica P., et al*  
Thermal analysis of boulders on the 67P/Churyumov-Gerasimenko comet  
*EPSC, Vol. 12, EPSC2018-267, 2018*
3. *Susan J. Conway et al.*  
Evaluating the performance of CaSSIS elevation data for geomorphological and geological analyses  
*Vol. 12, EPSC2018-962, 2018*
4. *R.Politi, E.Simioni et al.*  
BepiVR: Virtual Reality for BepiColombo outreach  
*Vol. 12, EPSC2018-286-1, 2018*

## 2017

5. *Simioni, E.,et al*  
A photogrammetric pipeline for the 3d reconstruction of cassis images on board ExoMars TGO.  
*International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences 42 2017.*
6. *Pajola M., Simioni E. et al.*  
Refining the boundary between the Phobos Blue/Red spectral units with the ExoMars-CaSSIS imagery  
*EPSC Abstracts European Planetary Science Congress Vol. 11 2017*
7. *Massironi, et al.*  
A three-dimensional geological reconstruction of Noctis Labyrinthus slope tectonics from CaSSIS



data EPSC Vol. 11,  
*EPSC2017-618-1, 2017*

8. *Pajola M. et al.*

Spectral Modelling of the 0.4-2.5  $\mu\text{m}$  Phobos CRISM dataset.  
*EGU General Assembly Conference Abstracts. Vol. 19. 2017.*

9. *Pajola M., et al.*

Phobos MRO/CRISM Visible and Infrared (0.4–2.5  $\mu\text{m}$ ) Spectral Clustering.  
*Lunar and Planetary Science Conference. Vol. 48. 2017.*

10. *Cremonese G., Simioni E. et al.*

First Mars Surface Stereo Reconstruction with the CaSSIS Stereo Camera.  
*Lunar and Planetary Science Conference. Vol. 48. 2017.*

## 2016

11. *Cremonese G. et al*

New global maps of Europa's lineaments.  
*AAS/Division for Planetary Sciences Meeting Abstracts. Vol. 48. 2016.*

12. *Tantardini, Marco, et al.*

A possible Italian contribution in the NASA asteroid redirect robotic mission (ARRM).  
*INTERNATIONAL ASTRONAUTICAL CONGRESS: IAC PROCEEDINGS.* International Astronautical Federation, IAF, 2016.

13. *Lucchetti A et al.*

Fractal analysis on Enceladus: a global ocean underneath the icy crust.  
*EGU General Assembly Conference Abstracts. Vol. 18. 2016.*

14. *Massironi. M. et al*

A 3D geological model of 67P Churyumov-Gerasimenko northern hemisphere.  
*EGU General Assembly Conference Abstracts. Vol. 18. 2016.*

15. *Giacomini L. et al.*

Geologic mapping of the Comet 67P/Churyumov-Gerasimenko's Northern Hemisphere.  
*Monthly Notices of the Royal Astronomical Society(2016): stw2848.*

16. *Lee Jui-Chi et al.*

Geomorphological Mapping on the Southern Hemisphere of Comet 67P/Churyumov-Gerasimenko.  
*EGU General Assembly Conference Abstracts. Vol. 18. 2016.*

17. *Massironi M., Simioni E. et al.*

Layering and internal structure of the comet 67P/Churyumov-Gerasimenko as observed by ROSETTA.  
*Memorie della Società Astronomica Italiana 87 (2016): 153.*

## 2015

18. *Re C., Simioni E. et al.*

The first DTM generated by STC/SIMBIOSYS that will be on board the BepiColombo mission.  
*EGU General Assembly Conference Abstracts. Vol. 17. 2015.*

19. *Pajola M. et al.*

Geomorphological and Spectrophotometric Study of Philae Landing Site A.  
*EPSC Abstracts European Planetary Science Congress 2015 Vol. 10, EPSC2015-526, 2015*

20. *A. Lucchetti, et al*

New simulation of Phobos Stickney crater  
*46th Lunar and Planetary Science Conference, held March 16-20, 2015 LPI Contribution No. 1832,*

p.1420

21. *Simioni E. et al.*  
Multiple 3D reference system analyses for Phobos grooves, a novel approach.  
*EGU General Assembly Conference Abstracts. Vol. 17. 2015.*
22. *Pajola, M. et al.*  
First analysis of the size-frequency distribution of boulders  $\geq 7$  m on comet 67P.  
*Mem. S.A.It. Vol. 87, 156*
23. *Pajola, M. et al.*  
The global size-frequency distribution of boulders  $> 7$  m on Comet 67P Churyumov-Gerasimenko.  
*EGU General Assembly Conference Abstracts. Vol. 17. 2015.*
24. *Massironi M., Simioni E. et al.*  
Layering and geological inner structure of 67P Churyumov-Gerasimenko comet nucleus.  
*EPSC Abstracts European Planetary Science Congress 2015 Vol. 10, EPSC2015-710, 2015*

#### 2014

25. *Pajola, M., Simioni E. et al.*  
Phobos Grooves Analysis: do They Favor the In Situ or the Asteroidal Capture Origin?.  
*AGU Fall Meeting Abstracts. Vol. 1. 2014.*
26. *Simioni E. et al.*  
Indoor calibration for stereoscopic camera STC, a new method.  
*International Conference on Space Optics. Vol. 7. 2014.*
27. *Massironi, M. et al.*  
First geological mapping of 67P/Churyumov-Gerasimenko nucleus from Rosetta mission.  
*EPSC Abstracts Vol. 9, 2014*
28. *Simioni E. et al.*  
Stereo Camera for satellite application: A new testing method.  
*Metrology for Aerospace (MetroAeroSpace), 2014 IEEE (2014): 582-587.*
29. *Da Deppo V. et al.*  
Preliminary results of the optical calibration for the Stereo Camera STC on-board the BepiColombo mission.  
*International Conference on Space Optics. Vol. 7. 2014.*

#### 2011

30. *Cremonese G. et al.*  
Hydrocode simulations of few Lutetia craters.  
*EPSC-DPS Joint Meeting. Vol. 6. 2011.*

#### 2010

31. *Pozzobon R., et al.*  
Association of late cone sheets and radial dykes on Ascreaeus Mons.  
*European Planetary Science Congress Abstracts. Vol. 5. 2010.*
32. *Cremonese G. et al.*  
Expected performance of the stereo camera on board the BepiColombo mission.  
*38th COSPAR Scientific Assembly, 38 (2010): 15.*

#### 2009

33. *Cremonese G., Simioni E. et al.*

A New Stereo Reconstruction Software for STC/SIMBIOSYS on BepiColombo.  
*AAS/Division for Planetary Sciences Meeting Abstracts# 41. Vol. 41. 2009.*

Participations to Congresses and  
 Team Meeting

**Organization or participation as relator to team meetings of scientific nature in Italy or abroad:**

- Participation and Organization  
 CaSSIS Team Meeting, Padova, February 2018
- Speaker – Oral Presentation  
 SIMBIO-SYS Team Meeting “**STC – Geometrical Calibration**”,  
 “**SIMBIOSYS – Flight Operation Procedures**”  
*Paris, November 2017*
- Speaker – Oral Presentation  
 CaSSIS Team Meeting, “**First DTMs of CaSSIS**”,  
*Bern, June 2017*
- Speaker – Oral Presentation  
 CaSSIS Team Meeting, “**Padova 3D pipeline**”,  
*Padova, June 2017*
- Speaker – Oral Presentation  
 SIMBIO-SYS Team Meeting “**STC - Stereo Validation**”,  
*Padova, September 2016*
- Speaker – Oral Presentation  
 SIMBIO-SYS Team Meeting “**STC detector, results on the last tests**”,  
*Roma, September 2014*

**Organization or participation as speaker an international congresses of scientific nature in Italy or abroad:**

- Speaker – Oral Presentation  
 OAPD, Astropizza, Osservatorio di Padova, Università di Padova  
 “3D, da STC-Stereo Camera a Blender”
- Poster  
 Space Telescopes and Instrumentation  
 “The pre-launch distortion definition of SIMBIO-SYS/STC stereo camera by rational function models” ([link](#)), San Diego, USA, 2017
- Speaker – Oral Presentation  
 ISPRS,  
 “A photogrammetric pipeline for the 3d reconstruction of CaSSIS images on board ExoMars TGO.”, ([link](#)) Hong-Kong, China, August 2017
- Speaker – Oral Presentation  
 ICSSO  
 “CMOS Detectors: Lessons learned during the STC Stereo Channel Pre-flight Calibration” ([link](#))  
 Biarritz, France, October 2016
- Speaker – Oral Presentation  
 SPIE Astronomical Telescopes+ Instrumentation. International Society for Optics and Photonics,  
 “Geometrical distortion calibration of the stereo camera for the BepiColombo mission to Mercury.” ([link](#)) 2016
- Speaker – Oral Presentation  
 DEI, Dipartimento di Ingegneria dell'Informazione, Università di Padova  
 “Photogrammetric methods and Imaging techniques in Astronomical Applications”
- Speaker – Oral Presentation

ICSO

"Indoor calibration for stereoscopic camera STC, a new method" ([link](#)) Tenerife, Spain, October 2014

- Speaker – Oral Presentation

IEEE International Workshop on Metrology for Aerospace

"Stereo Camera for satellite application A new testing method"([link](#)) ,Benevento June 4-5 2014

- Poster

Space Telescopes and Instrumentation

"Preliminary LSF and MTF determination for the stereo camera of the BepiColombo mission"([link](#)), Montréal, Quebec, Canada June 22, 2014

**Other participations to international congress (IC) or team meeting (TM) of scientific nature in Italy or abroad:**

- Digital Specimen 2014. Berlin, Germany, September 7-12 2014
- ISPRS, Technical Commission V Symposium, Riva del Garda (VR), Italy, 22-25 June 2014
- WAVES, International Oceanographic Congress Madrid, Spain. 2007

**Books and monographies**

- *Barbieri C. et al* Comet 67P/CG seen through Osiris, the eyes of Rosetta. Rendiconti Lincei: 1-29.

**Technical Notes**

- **Simioni et al, SIMBIO-SYS/STC SNR Performance Report**  
BC-SIM-OAPD-013 Issue 1.02018
- **Simioni et al, STC-Focusing Report**  
BC-SIM-GAF-PR-0ZZ 2014
- **Simioni et al, STC Stereo Validation Analysis report**  
Contract Deliverable, BC-SIM-GAF-DEL-0022011
- **Simioni et al, Preliminary analysis of the advantage due to the overlapping in the STC stereo reconstruction**  
BC-SIM-OPD-TN-008, 2008.

Documents or Products

**Software products in the field of technological research or as a support for scientific analysis**

▪ **3DPD**

Responsible for the 3D reconstruction pipeline from CaSSIS stereo images (ExoMars2016) or (in the future) of STC in C #. The software is a multiprocessor code with a graphical interface that allows refining the parameters of the pipeline by displaying quality maps and parallax maps to avoid artefacts in DTMs. The product has led to the following publications:

- *Simioni, E., et al* 3DPD application to the first CaSSIS DTMs ,EPSC, Vol. 12, EPSC2018-380, 2018
- *Susan J. Conway et al.*  
Evaluating the performance of CaSSIS elevation data for geomorphological and geological analyses  
Vol. 12, EPSC2018-962, 2018
- *Simioni, E., et al*  
A photogrammetric pipeline for the 3d reconstruction of cassis images on board ExoMars TGO.International  
Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences 42 2017.
- *Pajola M., Simioni E. et al.*  
Refining the boundary between the Phobos Blue/Red spectral units with the ExoMars-CaSSIS imagery  
EPSC Abstracts European Planetary Science Congress 2017
- *M.Massironi., et al.*  
A three-dimensional geological reconstruction of Noctis Labyrinthus slope tectonics from CaSSIS data  
EPSC Vol. 11, EPSC2017-618-1, 2017
- *Cremonese G., Simioni E. et al.*  
First Mars Surface Stereo Reconstruction with the CaSSIS Stereo Camera.Lunar and Planetary Science Conference. Vol. 48. 2017.

▪ **CASSIS-IMAGES TOOL**

Supervision and coding for the pipeline (MATLAB) for reading, mosaicking, organization for the scientific analysis of images of the CaSSIS camera for the ExoMARS2016 mission with the aim of generating a (mirror) archive of CaSSIS images at the observatory of Padua, through mosaics, definition of ground-based FoV, location of acquisitions on MOLA. The tool includes sub-sections for image alignment using image descriptors (SURF) and homographies.

▪ **OAPD-REPOSITORY**

Site supervision of dynamic pages for the management and storage (by the entire CaSSIS Team) of the DTMs (3d images) of the instrument. The site (link) allows the reservation of the DTMs by the scientist and the institutes that deal with it. Each stored DTM generates a dynamic page connected to CAST (NASA) query pages in order to have a direct link to the institute's repository allows the reservation of the DTMs by the scientist and the institutes that deal with it. Each stored DTM generates a dynamic page connected to CAST (NASA) query pages in order to have a direct link to the institute's repository

▪ **STEREO-PLOT TOOL**

Tool (Matlab) for the automatic or supervised detection of the features of a minor body and their analysis through stereo-plot measurement systems for comparison with impact, tide or gravity models. The product has led to the following publications:

- *Penasa, L., et al*  
."A three-dimensional modelling of the layered structure of comet 67P/Churyumov-Gerasimenko."  
Monthly Notices of the Royal Astronomical Society 469.Suppl\_2: S741-S754.(2017)
- *Massironi M., Simioni E. et al*

Two independent and primitive envelopes of the bilobate nucleus of comet 67P.  
**Nature** 526.7573 (2015): 402-405.

- *Massironi M., Simioni E. et al.*  
Layering and geological inner structure of 67P Churyumov-Gerasimenko comet nucleus.  
EPSC Abstracts European Planetary Science Congress 2015  
Vol. 10, EPSC2015-710, 2015
- *Simioni E et al.* Phobos grooves and impact craters: a stereographic analysis.  
Icarus256 (2015): 90-100.
- *Massironi, M. Simioni E. et al.*  
Layering and internal structure of the comet 67P/Churyumov-Gerasimenko as observed by ROSETTA.  
Memorie della Societa Astronomica Italiana 87 (2016): 153.

#### ▪ **DUST DETECTION**

Tool (MATLAB) for the detection (through classifiers and image descriptors) and modelling of the photometric traces of the dust in orbit around the nucleus of CG67P proven by the following publications:

- *Frattin, Elisa, et al.*  
Post-perihelion photometry of dust grains in the coma of 67P Churyumov-Gerasimenko." Monthly Notices of the Royal Astronomical Society 469.Suppl\_2 (2017): S195-S203.(2017)
- *Cremonese G., Simioni E. et al.*  
Photometry of dust grains of comet 67p and connection with nucleus regions. Astronomy & Astrophysics588 (2016): a59.

#### ▪ **STC-CMOS CALIBRATION TOOL**

Tool (Matlab) for the reduction (real time and a posteriori) of the STC Stereo Camera images and for the modeling of the spurious bias phenomena of the instrument; The results obtained are described in the following documents and led to the following publications.

- **SIMBIO-SYS FM User Manual**  
Contribution to the drafting of the User Manual of the instrument  
BC-SIM-GAF-MA-002 Rev 5-6-7-8-9-102017-2018
- **Simioni et al, SIMBIO-SYS/STC SNR Performance Report**  
BC-SIM-OAPD-013 Issue 1.02018
- **SIMBIO-SYS INSTRUMENT SCIENCE PERFORMANCE REPORT**  
Contribution to the drafting of the ISPR of the instrument  
BC-SIM-PI-RP-0012017
- *Slemer, A., et al.*  
A Mercury surface radiometric model for SIMBIO-SYS instrument suite on board of BepiColombo mission.  
*Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimetres Wave.* Vol. 10698. International Society for Optics and Photonics, 2018.
- *Slemer, A., et al.*  
Performances of the SIMBIO-SYS Stereo Imaging Channel (STC) on board BepiColombo/ESA spacecraft  
IEEE , Metrology Roma 2018
- *Da Deppo V et al*  
Optical design and performance of the Stereoscopic Imaging Channel for the ESA BepiColombo mission.  
International Optical Design Conference. Optical Society of America, 2017
- *Simioni E.et al.*  
CMOS Detectors: Lessons learned during the STC Stereo Channel Pre-flight Calibration Biarritz, France, October 2016
- *Simioni E.et al*  
Preliminary LSF and MTF determination for the stereo camera of the BepiColombo mission.

SPIE Astronomical Telescopes+ Instrumentation (2014): 914341-914341.

#### ▪ STC-VALIDATION TOOL

Tool (Matlab) for the reduction (in quick look or after) of the STC Stereo Camera images for the purpose of validating the photogrammetric capabilities of the instrument in relation to lighting conditions and compression. The product has led to the following publications:

- *Re C, Simioni E. et al.*  
Estimate of DTM Degradation due to Image Compression for the Stereo Camera of the Bepicolombo Mission.  
ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (2016): 471-478.
- *Re C., Simioni E. et al*  
DTM generation from STC-SIMBIO-SYS images.  
SPIE Optical Metrology(2015): 95280P-95280P.
- *Simioni E. et al.*  
Indoor calibration for stereoscopic camera STC, a new method.  
International Conference on Space Optics. Vol. 7. 2014.

#### ▪ STC-GEOMETRIC TOOL

Tool (Matlab) for the reduction (real time and a posteriori) of the STC Stereo Camera images for the measurement of geometric optical distortion using RFM models (Rational Function Models) and their relationship with temperature variation. The product has led to the following publications:

- *Simioni et al*, SIMBIO-SYS STC Calibration: Geometrical Distortion  
Review of Scientific Instruments , submitted 19/07/2018
- *Simioni, E. et al.*  
The pre-launch distortion definition of SIMBIO-SYS/STC stereo camera by rational function models."  
*Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimetres Wave*. Vol. 10698. International Society for Optics and Photonics, 2018.
- *Simioni E. et al.*  
Geometrical distortion calibration of the stereo camera for the BepiColombo mission to Mercury.  
SPIE Astronomical Telescopes+ Instrumentation (2016): 990410-990410.

### PRODUCTS FINALIZED IN THE OUTREACH OR THE THIRD MISSION

**Among the products of the research activity, they must also be included those dedicated to the dissemination in particular an annual production of 1-2 videos both 2D and stereograms (3d, VR or 360) in order to raise awareness of the missions to which I participate. In particular BepiColombo, Rosetta, Exomars2016.**

**These are accompanied by applications for the generation of models from scientific DTMs:**

- 3D texturized models for Mars (MOLA) Region  
*Simioni E. et al 2018* Astrophysics Source Code Library, v.2056

**The list of these products is documented in following Section: "Documented activities of dissemination, organization of events and third mission"**



Duly documented service and teaching assignments

**Assignment of teaching or research assignments (fellowships) to qualified foreign or supranational universities or research institutes:**

- Correlator of the Thesis of M.Mocellin; Title "*Shape from silhouette reconstruction and self-calibration in X-ray Applications*"  
Relator: Poletto. – Università degli Studi di Padova –A.A. 2011-2012
- Correlator of the Thesis of Vazzola A; Title: "*On-fly WAC calibration, flyby analysis and 3D reconstruction of asteroid Steins Performance analysis of correlation image algorithm for the planetary DTM generation*"  
Relator: Prof. Naletto – Università degli Studi di Padova –A.A. 2010-2011
- Master – Teaching in Computer Graphics of Applied Optics Master - DEI Padova. A.A. 2006-2007
- Master – Teaching in Computer Graphics of Applied Optics Master - DEI Padova. A.A. 2008-2009

**Reviewer Experience for Journals of recognized prestige in the sector:**

- 2015-2017 Planetary and Space Science
- 2017-2018 Photogrammetric Engineering & Remote Sensing
- 2017-2018 IETE Journal of Research
- 2016-2017 International Journal of Digital Earth

Documented activities of dissemination, organization of events and third mission

**Modelling and video editing activities for the production of video products aimed at the Outreach or the Third Mission:**



- 2018 "BepiRobot to Mercury 360".  
Video VR 360 (stereogrammetric) for VT glasses or Oculus visors for the valorisation of the contribute ASI-INAF to BepiColombo mission ([link](#)).
- 2018 "Marte come non lo avete mai visto".  
Series of Video on the Martian surface using the DTM of the telescope produced at PD for the enhancement of the ASI-INAF contribution to the BepiColombo mission. The videos have been published at national level on the main newspapers ([link](#)).
- 2017 "BepiRobot to Mercury".  
Video 2D e VR (stereogrammetric) for active and passive televisions for the valorisation of the contribute ASI-INAF to BepiColombo mission ([link](#)). Also proposed in national television networks (SuperQuark 2018 [link](#))
- 2016 "Viaggio in 3D tra pianeti e comete"  
Video 2D e VR (stereogrammetric) for active and passive televisions and Video for olographic pyramid for the valorisation of the ASI-INAF contribute to Rosetta mission ([link](#)).
- 2015 " Il Pianeta Rosso"  
for active and passive televisions for the valorisation of the ASI-INAF contribute to ExoMars mission ([link](#)).



- 2014 “STC, ricostruzione 3D da satellite”  
Video 2D finalized to the presentation of STC instrument ([link](#)).
- Speaker at outreach events:
  - 2017-2018 Cosmos Discovery, Roma
  - 2015-2017 Bergamo Scienze, Bergamo (vedi allegato Alleg.Altro01-02-03)
  - 2015-2017 Sperimentando, Padova
  - 2015-2017 La Notte del Ricercatore (OAPD) (vedi Allegato Alleg.Altro04)
  - 2017 SAIT - LXI Congresso della Società Astronomica Italiana

Dissemination activities at primary or secondary schools through videos:

- 2017 “Collegio Vescovile PioX di Treviso”, Treviso
- 2017 “Istituto Comprensivo Statale Albignasego Padova”, Albignasego (Pd)
- 2016 “Scuole Montecchio Maggiore (VI)”

Speaker at other events:

- 2016 (9 May)  
Speaker and interviewed  
“Mercury transit event” at Asiago Observatory.
- 2014 “ Viaggio in 3D tra i pianeti e la cometa”.  
Speaker  
Event “Tea in orbita”, Padova [OAPD] “Rosetta cacciatrice di comete...e altre storie” 24/10/2014.

▪

**Others Visiting Scientist experiences at qualified universities or foreign or supranational research institutes:**

- 2015 (1 month)  
Visiting Post DOC:  
At Bern University (Prof.Dr. *Nicolas Thomas* ) for the on ground calibration of CaSSIS (EXO-Mars2016)
- 2010 (6 months)  
Visiting PhD student:  
At DLR (German Aerospace Centre) in Berlin (Prof. *Jürgen Oberst*) for the definition of the 3d reconstruction pipeline from a frame camera.
- 2008 (8 months)  
Visiting PhD student:  
At DLR (German Aerospace Centre) in Berlin (Prof. *Jürgen Oberst*) for the definition of the 3d reconstruction pipeline from a frame camera.
- 2004 (1 month) Visiting student:  
At Oceanography, Hamburg (Prof. Susan Lerner) for the definition of the 3d reconstruction pipeline of sea surface images.

**Courses and other training experiences at qualified universities or foreign or supranational research institutes:**

- 2008 HRSC & OMEGA (ESAC). Mars-Express mission Villafranca del Castillo (Madrid, Spain) Summer School.
- 2009 Elaboration of geo-spatial data and integration in GIS platform by IDL and ENVI

- 2011 ENVI (Padova). Course for the application of ENVI to stereo-images.
- 2014 Corso di modellazione 3D in Blender (Berlin, Digital Specimen 2014)
- 2014 Corso di modellazione e Video Editing in Blender (FabLab, Verona)

#### Participation to proposal:

- **SIMIO-SYS (2018)**  
 “Spectrometer and Imagers for Moon Integrated Observatory System” in response to the ESA Request for Information, on Lunar Exploration Campaign Science and Technology Payloads. HERACLES.  
 Role: Co-I in the WP of operations, software, calibration:
- **ARM 2016-2017**  
 Role: *Consultant for the proposal for Mission ARM/NASA*
- **HYSOS**  
*Role: Consultant for the proposal Horizon 2020, H2020-COMPET-2016 Competitiveness of European Space Sector: Technology and Science), Hypsos*
- **FIRB 2008** (program "Futuro in ricerca")  
 S.Margin, Simioni et al Title: "*Sviluppo di metodi per l'analisi dati di corpi astronomici solidi osservati da missioni spaziali*"

#### Press release

#### Communications or press reviews at national or international level

- 2018 – Press Release  
 MEDIA-INAF "Marte: così non lo avete mai visto" ([link](#))
- 2016 - Press Release  
 MEDIA-INAF "Marte, le prime immagini dall'orbitatore europeo" ([link](#))
- 2016 - Press Release  
 CNR "La prime immagini della superficie di Marte acquisite dalla camera CaSSIS" ([link](#))
- 2015 - Press Release  
 MEDIA-INAF "CaSSIS, il telescopio svizzero dal cuore italiano" ([link](#))
- 2015 - Press Release  
 MEDIA-INAF "67P: un bacio tra comete" ([link](#))