



## Personal information

Surname / First name

**Ziosi Brunetto Marco**

Address

via Ivancich n.17, 30174, Chirignago (VE)

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Email

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Nationality

Italian

Date of birth

03/05/1985

Current Position

PhD student since 01/2012 at Università degli Studi di Padova - Dipartimento di Fisica e Astronomia **PhD advisors:** Dr. Michela Mapelli (INAF-OAPd) **PhD Fellowship funded by:** Strategic Research Project AACSE - Algorithms and Architectures for Computational Science and Engineering  
PhD Thesis submission expected in July 2015

## Education

2012-present

PhD School in Astronomy - Dipartimento di Fisica e Astronomia (Università degli Studi di Padova), Research project title: **"The impact of stellar evolution and dynamics on the formation of compact-object binaries"**, supervisors: Dr. Michela Mapelli

2007-2011

Master Degree Thesis in Astronomy - Dipartimento di Fisica e Astronomia (Università degli Studi di Padova), (108/110): **"Halo-matter cross-correlation in cosmological simulation"**, supervisors: Prof. Giuseppe Tormen and Prof. Ravi K. Sheth

2004-2007

Bachelor Degree Thesis in Astronomy - Dipartimento di Fisica e Astronomia (Università degli Studi di Padova), (103/110): **"Studio del profilo dei vortici ottici con diverso momento angolare"** (Characterization of optical vortexes with different angular momentum), supervisors: Prof. Cesare Barbieri, Dr. Fabrizio Tamburini, Dr. Gabriele Anzolin

## Teaching experience

2012-2013

- Teaching assistant - Dipartimento di Fisica e Astronomia (Università degli Studi di Padova), Mathematical
- Teaching assistant - Dipartimento di Fisica e Astronomia (Università degli Studi di Padova), Python course

## Grants

2013

Awarded 1000 EUR to attend the Gravasco IHP trimester "N-body gravitational dynamical systems From  $N=2$  to infinity."

## Accepted computational proposals

2014

- “Young star cluster disruption by tidal fields”, 50.0k CPU hours on GPU cluster EURORA @ CINECA, PI: Mapelli, CO-I: Ziosi and Moretti
- “Star cluster formation through merger of sub-clusters”, 50.0k CPU hours on IBM PLX cluster @ CINECA, PI: Mapelli, CO-I: Ziosi and 3 other COIs

2013

- “Investigating the statistics and parameter space of double compact object binaries in young star clusters”, 50.0k CPU hours on GPU cluster EURORA, IBM PLX cluster and IBM Blue Gene/Q Fermi @ CINECA, PI: Ziosi, 2 COIs
- “Making very massive stars through stellar collisions”, 50.0k CPU hours on GPU cluster EURORA and IBM PLX cluster @ CINECA, PI: Mapelli, CO-I: Ziosi and 2 other COIs
- “Star formation in proximity of a supermassive black hole”, 2.28M CPU hours on the IBM Blue Gene/Q Fermi cluster @ CINECA, PI: Mapelli, CO-I: Ziosi and 2 other 7 COIs

2012

- “The violent life of the Galactic Centre”, 281.6k CPU hours on IBM PLX and on the IBM Blue Gene/Q Fermi cluster @ CINECA, PI: Mapelli, CO-I: Ziosi and 2 other COIs
- “Computational Frontiers of Black Hole Dynamics”, 50.0k CPU hours on IBM PLX cluster @ CINECA, PI: Ripamonti, CO-I: Ziosi and 2 other COIs

## Schools and Workshops

2014

- **Tools and Techniques for massive data analysis**, CINECA (Bologna), 15-16 December 2014
- **Perspectives of GPU computing in Physics and Astrophysics**, Dep. of Physics of Sapienza - Rome, 15-17 September 2014 (poster)
- **Stellar N-body Dynamics**, Sexten (Italy), 8-12 September 2014 (poster)
- **Astro-GR@Rome**, Monteporzio Catone (Rome), 14-18 July 2014
- **MODEST 14 - The dance of stars: dense stellar systems from infant to old**, Bad Honnef Physics Center (Germany), 2-6 June 2014 (poster)

2013	<ul style="list-style-type: none"> <li>– <b>Workshop on Dynamics &amp; Kinetic theory of self-gravitating systems</b>, Grivasco IHP trimester “N-body gravitational dynamical systems From N=2 to infinity...”, Paris, 4-8 November 2013 (contributed talk)</li> <li>– <b>Seminar on Galactic Dynamics</b>, Grivasco IHP trimester “N body gravitational dynamical systems From N=2 to infinity...”, Paris, 21 October-1 November 2013</li> <li>– <b>Workshop on High Performance Scientific Computing</b>, Strategic Research Project AACSE, Departement of Information Engineering - Padova, 9 Sempember 2013</li> <li>– <b>PhD Summer School on High Performance Scientific Computing</b>, Strategic Research Project AACSE, Departement of Information Engineering - Padua, 16-18 Sempember 2013 (contributed talk)</li> <li>– <b>INFN School Of Statistics</b>, Vietri sul Mare (Italy), 3-7 June 2013</li> <li>– <b>School on Gravitational Waves, neutrinos and multiwavelenght e.m. observations: the new frontier of Astronomy</b>, Monteporzio Catone (Rome), 10-15 April 2013</li> </ul>
2012	<ul style="list-style-type: none"> <li>– <b>IMPRS Summer School on Computational Astrophysics</b>, Heidelberg, Germany, 10-14 September 2012</li> <li>– <b>International School of Astrophysics on the Fundamental Cosmic distance scale and the Transient Sky</b>, Teramo, Italy, 11-15 June 2012 (contributed talk)</li> <li>– <b>Summer School of Parallel Computing</b>, CINECA (Bologna), 2-13 July 2012</li> <li>– <b>Introduction to C language for scientific programming</b>, CINECA (Bologna), 17-18 May 2012</li> </ul>
2011	<ul style="list-style-type: none"> <li>– <b>PhD Summer School on Algorithms and Architectures for Computational Science and Engineering</b>, Departement of Information Engineering - Padua, 12-16 Sempember 2011 (contributed talk)</li> <li>– <b>Workshop on Visualization of Large scientific Data</b>, CINECA (Bologna), 14-15 June 2011</li> <li>– <b>Python for computational science</b>, CINECA, 16-18 May 2011</li> <li>– <b>Introduction to GPGPU and CUDA programming</b>, CINECA (Bologna), 27 April 2011</li> </ul>
<b>Other courses and experiences</b>	
2014	Amazon Web Services Cloud School, 24 July 2014, Milano
2011	Internship at University of Padova: “Technical characterization of the Astrophysical Observatory of Asiago”
2009	Certificate of photometric and spectroscopic digital analysis expert (FSE european course)
2007	Certificate of digital data analysis expert (FSE european course)
2004	“Il cielo come laboratorio” (Sky as a lab), in collaboration with the Astronomy Department of the University of Padua

## Publications

- Ziosi B. M., Mapelli M., Branchesi M., Tormen G., *Dynamics of stellar black holes in young star clusters with different metallicities - II. Black hole-black hole binaries*, 2014, MNRAS, 441, 3703Z
- Branchesi M. , Woan G., Astone P., Bartos I., Colla A., Covino S., Drago M., Fan X., Frasca S., Hanna C., Haskell B., Hazboun J.S., Heng I.S., Holz D.E., Johnson-McDaniel N.K., Jones I.D., Keer L., Klimentenko S., Kostas G., Larson S.L., Mandel I., Mapelli M., Messenger C., Mazzolo G., Melatos A., Mohanty S., Necula V., Normandin M., Obara L., Opiela R., Owen B., Palomba C., Prodi G.A., Re V., Salemi F., Sidery T.L., Sokolowski M., Schwenzer K., Tiwari V., Tringali M.C., Vedovato G., Voudsen W., Yakushin I., Zdrożny A., Ziosi B.M., *C7 multi-messenger astronomy of GW sources*, 2014, General Relativity and Gravitation, 46, 1771

## Scientific interests

- dynamics of black holes and neutron stars in star clusters
- direct-summation N-body simulations in star clusters
- gravitational waves in the frequency range of Advanced VIRGO and LIGO
- stellar and binary evolution
- big data analysis and visualization

## Reference persons

### **Dr. Michela Mapelli**

INAF - Osservatorio Astronomico di Padova  
Vicolo dell'Osservatorio 5  
35122 PADOVA (Italy)  
+39 049 8293 527  
michela.mapelli@oapd.inaf.it

### **Dr. Marica Branchesi**

University of Urbino Carlo Bo  
Piazza della Repubblica 13  
61029 Urbino (Italy)  
+39 0722 304521  
marica.branchesi@uniurb.it

### **Dr. Mario Spera**

INAF - Osservatorio Astronomico di Padova  
Vicolo dell'Osservatorio 5  
35122 PADOVA (Italy)  
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mario.spera@oapd.inaf.it

### **Dr. Fabrizio Tamburini**

TWIST OFF S.R.L.  
Via della Croce Rossa 112  
35129 Padova (Italy)  
+39 049 8697509  
fabrizio.tamburini@gmail.com

## Language skills

Italian (Mother tongue), English (fluent)

## Computer skills

OSs  
Scripting/Programming Languages  
Data Analysis/Plotting tools  
Experience in HPC

Linux (excellent), MacOS (excellent), Windows (excellent)  
Python (excellent), Go (excellent), Bash (excellent), C/C++, Matlab/Octave, Fortran, IDL  
Veusz (excellent), Matplotlib/Pylab (excellent), Supermongo, Gnuplot, IDL, IRAF

*Codes:* StarLab-GPU, Gadget

*Libraries:* Experiences with MPI and OpenMP

*HCP facilities I have used during my PhD:*

- **Eurora** (CINECA): Linux Cluster with 1024 cores (Intel Xeon E5-2658 and E5-2687W), 1.1 TB of RAM, 64 nVIDIA Tesla K20 (Kepler), CINECA storage, Infiniband network
- **Green II/gStar&swinStar** (Swinburne University): Linux cluster with 1976 cores (Intel Xeon 5650 and E5-2660), 7.904 TB of RAM, 100 NVIDIA Tesla C2070, 21 NVIDIA Tesla M2090, 64 NVIDIA Tesla K10, 1.6 PB Lustre file system, QDR infiniband
- **PLX** (CINECA): Linux cluster with 3288 cores (Intel Xeon E5645), 528 nVIDIA Tesla M2070, 20 nVIDIA Tesla M2070Q, 14 TB of RAM, CINECA storage, Infiniband network
- **ZBOX** (University of Zurich): Linux cluster with 3072 cores (Intel Xeon E5), 12 TB of RAM, 684 TB Lustre filesystem, 800 TB tape backup, Infiniband and Gbit ethernet network
- **monster** (Dept. of Physics and Astronomy, UniPD): Linux cluster with 104 core (Intel Xeon e5430), 464 GB of RAM, 6.39 TB storage, Gbit ethernet network
- **SP7** (Dept. of Information Engineering, UniPD): IBM Power7 system, 92 equivalent computing cores for Linux (124 for ADA), 768 GB of RAM shared through hardware board, 1 TB storage, Infiniband network

Markup Languages/Web  
Graphics  
Presentation  
Office/Internet  
Others

LaTeX, Markdown, HTML, Javascript  
Inkscape, Gimp, ImageMagick, Blender  
Beamer, Sozi/Inkscape, Prezi, PowerPoint, HTML/Javascript based tools like ImpressJS and Remark  
MSOffice, LibreOffice/OpenOffice, Chrome, Internet Explorer, Firefox, Opera, Outlook, Thunderbird  
Git, MySQL, PostgreSQL

## Other interests

Volunteering with A.G.E.S.C.I. and Protezione Civile (Civil Defense)  
Digital Photography  
Piano and guitar  
Travelling  
Mapping and geo-data manipulation

## Signature

