Mario Pasquato
Curriculum Vitae

Contact Information

Address: *
E-mail: mp5757@nyu.edu   Alternative e-mail: mario.pasquato@gmail.com
Office phone: *   Personal phone: +39 3496424752
Website: http://www.mariopasquato.com   Code: https://gitlab.com/mariomario
* to be assigned pending COVID-19 remote work arrangements

Professional Experience

Upcoming: Marie S. Curie Fellow, U. de Montréal & Padua University 01/09/2021 – 30/08/2024
Project RISING (Realistic and Informative Simulations with machine learnING) was evaluated 86.4% by the European Commission and will receive ~250 k$ of funding starting from Sept. 2021. As a global MSCA fellow I will spend two years at Montreal University –one of the leading centers for deep learning development in the world with MIT and Stanford- working on quantifying the realism of astrophysical simulations with autoencoder neural networks, returning to Padua for my last year according to current arrangements.

CAP^3 Fellow at New York University Abu Dhabi, United Arab Emirates, 01/09/2020 – 30/08/2021
Interdisciplinary, independent fellowship aimed at applying machine learning techniques to cosmology (especially zoom-in simulations), planetary and particle astrophysics – the three pillars of the CAP^3 center

Marie S. Curie Fellow, Padua Observatory, Italy, 01/09/2017- 30/08/2020 My project was named ARTificial Intelligence Search for Intermediate-mass black holes in star Clusters - *ARTIStIC*. I worked on a variety of astrophysical problems using deep learning (e.g. on mock images from star cluster simulations) and more conventional machine learning and clustering techniques. Co-supervised six students.

Senior Data Analyst, Kvadro-M, Ukraine, 01/06/2017 – 31/08/2017 Kvadro-M is a leading wholesaler of dental supplies in Ukraine. The company recently moved into the retail space, opening an e-commerce website (http://kvadro-m.com). I analyzed web marketing performance indicators in R and Tableau, and worked with Google tools, e.g. Search Console, Analytics, Adwords, and 3rd party SEO tools (Semrush).

Postdoctoral fellow, Yonsei University, Korea, 01/10/2012 – 31/05/2017 I developed my own computational astronomy research program with a focus on star-cluster dynamics and intermediate-mass black holes. Run and analyzed large sets of direct N-body simulations (with the NBODY6 code on GPUs). Between 30/06/2012 and 01/10/2012 I took some time off to prepare for moving to Korea, including a period to familiarize myself with the Korean language and culture.

Postdoctoral researcher, Bologna University, Italy, 01/07/2011 – 30/06/2012 Performed the simulation groundwork for Ferraro et al. 2012, a Nature paper on the formation mechanism of blue straggler stars in GCs. We reproduced their bimodal distribution with mass segregation of a pure binary population.

Contract Consultant, Pisa, Italy 27/01/2011 – 30/04/2012 I was registered as a professional in the field of education support activities for the period indicated (overlapping my first postdoc), with VAT number 01994790507. I provided training in statistics and computer skills, either on an individual or company level.

Education

Ph.D., Astrophysics, Pisa University, Italy, 01/01/2007 – 07/12/2010 Full, merit-based scholarship and tuition waiver. Thesis: *Globular clusters and intermediate-mass black holes: a model-free, non-parametric approach, between simulations and observations* - Advisor: Prof. G. Bertin (Milan University). During my Ph.D. course I **visited the European Space Agency ESTEC facility (Noordwijk, The Netherlands June 2009; expenses fully paid by ESA)** and was a **summer intern at Space Telescope Science Institute (Baltimore, USA, June-August 2008; expenses fully paid by STScI)**.

M.Sc., Physics Scuola Normale Superiore, Italy, 01/10/2001 – 01/10/2006 Full, merit-based scholarship and tuition waiver. Grade 70/70, summa cum laude.

M.Sc., Astrophysics Pisa University, Italy, 16/10/2004 – 26/09/2006 Grade: 110/110, Thesis: *The fundamental manifold of globular clusters*, Advisor: Prof. G. Bertin (Milan University)

B.Sc., Physics Pisa University, Italy, 12/10/2001 – 15/10/2004 Grade: 110/110, Thesis: *Stochastic resonance and its applications to biology*, Advisor: Prof. R. Mannella (Pisa University)

Grants, awards, memberships, and other achievements

Marie Skłodowska Curie Fellowship, 2020 MSCA-IF call, awarded for project *Realistic & Informative Simulations with machine learning (RISING);* **Value ~250k$.**
SID project 2020, internal competetive call for funding within Padua university. This is part of my collaboration with the economics department. Project title: *Historical institutional legacy and socio-economic spatial inequality in Europe. An interdisciplinary approach using machine learning, geo-processing and geographic regression discontinuity design on night-time light data.* PI Prof. Giulio Cainelli. **Value ~20k$.**
Member of the Italian National Institute for Nuclear Physics (INFN), Padua chapter, 2018-current
Astrofit2 MSCA-COFUND action, **grant agreement No. 664931**, **01/09/2017** Grant awarded for project *ARTificial Intelligence Search for Intermediate-mass black holes in star Clusters* (*ARTIStIC).* **Value ~200 k$.**
Grant N. 2017018587 by the National Research Foundation (NRF) of Korea, 02/06/2017 Awarded for project *Machine-learning search for intermediate-mass black holes.* The grant amounted to 250'000'000 Korean Won (**about 250 k$**) over a period of 3 years. Declined.
Member of the technical-scientific committee of the Italian Embassy in Korea, 2015-2017 I served as an evaluator for travel grant proposals within the framework *Grants to Explore Science and Technology Opportunities in South Korea (GESTO-SK)* by the Italian Embassy in Korea.
Member of the Korean Astronomical Society 2013-2016
PI of three Italian Super Computing Resource Allocation C-class projects CLUSTERS, 50k core-hours (Bologna, 2011); DLSCHIMB, 200k hours (Padua, 2018); DISSM67, 400k hours (Padua, 2019)
Confucius institute scholarship, Nankai University, China, 01/08/2011 – 31/08/2011 I was selected to receive a full immersion course in Chinese language at Nankai University in Tianjin, China. Living expenses fully paid by the ministry of education of the PRC.
Teaching qualification exam, Italy, 22/11/2007 Participated in the regional selection for teaching qualification for secondary education (*Scuola di Specializzazione all'Insegnamento Secondario; SISS*). Admitted, top applicant in ranking for Tuscany (the selection used to take place on a regional basis).
Admitted to Scuola Normale Superiore, Italy, 01/10/2001 Scuola Normale Superiore, similarly to the French École Normale Supérieure, grants admission yearly to a very limited number of students (about 50 between sciences and humanities, of which only ~10 for Physics) based solely on a written and oral examination. Students receive free board and lodging and a monthly stipend.

Teaching

Optics Laboratory, Padua University, Italy 06/05/2020 – 26/06/2020 Official name of the course: *Esperimentazioni di fisica II*. Undergraduate course for astronomers, shared with Prof. Stefano Ciroi, my part accounting for 36 hours of teaching. Due to the unprecedented situation arising from the COVID-19 pandemic, courses had to be taught remotely. This being a lab course, I devised two experiences that students could carry out at home with homemade equipment: building a camera obscura and measuring the refraction index of a sucrose solution. Course language: Italian.
Optics Laboratory, Padua University, Italy 06/05/2019 – 26/06/2019 Official name of the course: *Esperimentazioni di fisica II*. Undergraduate course for astronomers, shared with Prof. Davide de Salvador, my part accounting for 36 hours of teaching, including grading of student tests. Course language: Italian.
I was selected for teaching this course again in the spring semester of 2020.
Machine learning for astronomy, Padua University, Italy 15/02/2017 – 22/02/2017 Graduate course for astronomers, total of 10 hours of teaching. I devised the course syllabus and materials from scratch, and submitted it for dean approval. This was the first dedicated machine learning course taught to graduate students of the department, consisting entirely of hands-on activities in R. Course language: English.
Computational Astronomy, Yonsei University, Korea 20/02/2014 - 15/06/2014 Taught a semester course in computational astronomy, with my own materials and tests. Graded written examinations. Other 3 postdocs shared equally the teaching load, divided in four independent modules. I focused mainly on solving ordinary differential equations of astrophysical interest numerically, in Python. Course language: English.
Croatian black hole school, Trpanj, Croatia 21/05/2010 – 25/06/2010 Invited lecture on black holes from an astrophysical perspective (the school was attended mainly by theoretical physicists), in particular on intermediate mass black holes.
Teaching assistant – Pisa University Italy 01/03/2010 – 22/07/2010 Served as teaching assistant for analog electronics laboratory. This included grading written tests and performing oral examinations, assisting students with equipment, troubleshooting. Course language: Italian.

Mentoring

Ph.D. students
José Schiappacasse, Padua University, Italy, currently ongoing Ph.D. student on the *Chilean scholarship for doctoral studies abroad (Becas Chile para doctorado en el extranjero)* program; co-supervised with Dr. Sara Lucatello of Padua Observatory. The student is working with me for over 50% of his time on predicting star cluster properties (age, [Fe/H], distance...) from HR diagrams using machine learning.

Stefano Torniamenti, Padua University, Italy, currently ongoing Ph.D. student co-supervised with Prof. Michela Mapelli. Stefano is working with me for 25% of his time on applying generative models to produce synthetic outputs of star-cluster formation simulations run by Dr. Alessandro Ballone and Prof. Mapelli.

Master's
Gianluca Daniel, Padua University, Italy, currently ongoing Masters student, Preliminary thesis title: *Unsupervised machine learning for chemical tagging of open cluster stars.* Expected defense date in October 2020. Co-supervised with Prof. Antonino Milone (UniPD) and Dr. Antonella Vallenari (INAF).

Tobia Peruzzi, Padua University, Italy, 24/07/2020 Masters student, Thesis title: *SVM classification of AGN spectra with saliency map validation and feature visualization with t-SNE non linear dimensionality reduction.* Grade 110/110 summa cum laude. Student currently employed in the private sector. Student submitted one paper before thesis defense. Co-supervised with Prof. Stefano Ciroi.

Piero Trevisan, Padua University, Italy, 07/03/2019 Masters student, Thesis title: *Deep Convolutional Neural Networks in Astrophysics: a case study for gas turbulence*, Grade: 110/110 summa cum laude. Student submitted one paper before thesis defense (now accepted). Co-supervised with Prof. Michela Mapelli.

Hyunwoo Kim, Yonsei University, Korea, 15/06/2018 Masters student, Thesis title: *Kinematic Signature of Core Collapse in N-Body Simulations of Globular Clusters,* Grade: Pass. The student is currently employed in the private sector. Co-supervised with Prof. Suk-Jin Yoon.

Bachelor's
Erica Greco, Padua University, Italy, 14/12/2017 Bachelors student, Thesis title: *Formation and dynamical evolution of black hole binaries* (Official title in Italian: *Evoluzione e formazione dinamica di binarie di buchi neri*), Grade: 99/110; note that final grade for bachelors students is mostly based on course grades.

Other
Ugo Niccolò di Carlo, Insubria University, Italy Ph.D. student, recently co-authored the letter *Radial Dependence of the Proto-Globular Cluster Contribution to the Milky Way Formation* working with me on the simulation part. **This is his first paper not to involve his Ph.D. supervisor Prof. Francesco Haardt.**

Founder of the *Students & postdocs Original Journal club about the Universe (S.O.J.U.)*, Yonsei University, Korea, 27/02/2013 SOJU, the first regular journal club of Yonsei University's dept. of astronomy open to all students, was founded by me and three other postdocs to give students a way to practice public speaking while keeping updated on the most recent astro-ph preprints.

Outreach activities

European Researchers Night, Padua Astronomical Observatory, Italy, 27/09/2019 gave a `Young Researcher' talk on *Astronomy and Artificial Intelligence*

Outreach talk at Padua Planetarium, **Italy, 06/04/2019** I gave a talk on *Artificial Intelligence in Astronomy* to a paying audience at the Planetarium of Padua

European Researchers Night, Padua Astronomical Observatory, Italy, 28/09/2018

European Researchers Night, Padua Astronomical Observatory, Italy, 27/09/2017

Member of the Jury, Wiki Science Competition 2017, 01/11/2017 - 19/02/2018 Wiki Science competition is a competition for scientific photography held by the Wikimedia Foundation. I sat in the national jury for Italy, rating pictures submitted by the public in the capacity of expert in astrophysics.

Interview by ScienceNews, Kissimmee, US, 12/01/2016 I was interviewed by the US magazine ScienceNews (sciencenews.org) while attending the 227th American Astronomical Society Meeting. My interview is featured in the article *Red giants map how the Milky Way grew* by Andrew Grant

Outreach program staff, Pisa, Ludoteca Scientifica 02/04/2007 – 25/05/2007

Skills and assets

Programming Languages
R - fluent (code sample: most repositories in https://gitlab.com/mariomario)
Python – working knowledge (code sample using Keras: https://gitlab.com/mariomario/jellyfishtng)
C – working knowledge (code sample: https://gitlab.com/mariomario/quesodish)

Machine learning
Unsupervised learning in R: t-SNE and UMAP for **dimensionality reduction** (libraries *tsne*, *umap*), **clustering** with DBSCAN (library *dbscan*) and hierarchical and partitioning methods (library *cluster*). Supervised learning with traditional (not deep learning) tools in R such as **SVM** (library *e1071*), k-nearest neighbor (library *FNN*), **trees and random forests** (libraries *C5.0, party, randomForest*). **Neural networks** in R using the *h2o* library. Supervised learning with **deep convolutional neural networks** on images using *Keras* on top of *Tensorflow* in Python. Took part in several **competitions on the kaggle.com platform**, with results in the top 5% out of thousands of users. Selected competitions: Africa Soil Property Prediction Challenge **top 5%**; Prudential Life Insurance Assessment top 23%, awarded **silver medal** for kernels; Driver Telematics Analysis (sponsored by AXA insurance) top 34%; Diabetic Retinopathy Detection top 46%.

Astronomy specific computing skills
Codes for star-cluster dynamics: **NBODY 6** and **MOCCA** (I have access to the source code and to the MOCCA Survey Database I library of simulations through my collaboration with Prof. M. Giersz at the Copernicus Center for Astronomy in Warsaw, Poland). Planning and deploying large simulations, including on GPU clusters, using the relevant Unix/GNU- Linux and HPC tools (shell scripting, schedulers, performance monitors...). Writing, debugging and optimizing scripts for data processing, model fitting, plotting, and visualization both in R (using *ggplot2)* and in Python (using *astropy, matplotlib, seaborn*). Some experience with *SAOImage DS9*, *topcat*, *GRAVPOT16*. Astronomical database queries using *SQL*. As part of Prof. Mapelli's group at Padua University (both former and upcoming member) I have access to her set of thousands direct N-body simulations of star clusters. As current part of Prof. Macciò's group at NYUAD I have access to the NIHAO (Numerical Investigation of a Hundred Astronomical Objects) zoom-in cosmological simulations.

Other computing skills
Proficient in bash scripting. Version control with git. LaTeX and BibTeX (also on Overleaf.com). Jupyter notebooks. Basic SQL. Working knowledge of HTML 5 and CSS (e.g. simple site I made from scratch: http://dentalight.com.ua) and CMS systems such as Wordpress (e.g. my site http://www.mariopasquato.com). Experience with proprietary SEO tools (SEMRush). Owner of an account with 4000+ followers on Pinterest. Dataviz with Tableau (https://public.tableau.com/profile/mario.pasquato). Rapidminer data science platform.

Natural languages and soft skills
Able to communicate scientific results in fluent English (CEFR C2 level), both in written form and orally. Native speaker of Italian, working knowledge of German (B1), spoken Korean (B1), and Ukrainian (A2). Public speaking. Teamwork. Large network of collaborations. Scientific writing, grant writing. Ready to adapt to different cultural environments, eager to interact with the scientific community worldwide.

Publications
Metrics

Publications	35	Citations	692
Submitted	4	Median number of coauthors	4
Published + Accepted	31	h-index	12
1st author; 2nd author	14 ; 6	First author h-index	6
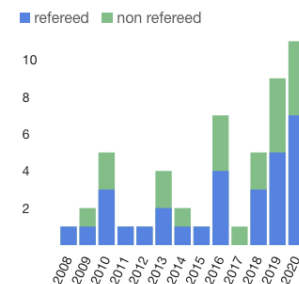
Data obtained from the Astrophysics Data System (adsabs.harvard.edu) on 13/09/2020. I am currently not part of large collaborations and I am 1st author in ~half of my publications. The apparent hiatus in research output in 2017 is due to a short period of work outside academia and to paternity.

Submitted (drafts available upon request when not on astro-ph)
1. *Detecting IMBHs with machine learning: I. feature-based supervised classification on MOCCA-SURVEY Database I simulations,* Pasquato, M., Mapelli, M., Askar, A., Giersz, M. 2019, A&A Submitted

2. *Multiple Stellar Populations in NGC 2808: a Case Study for Cluster Analysis,* Pasquato, M. & Milone, A. 2019, ApJ Submitted, astro-ph:1906.04983
3. *Introducing a multi-particle collision method for the evolution of dense stellar systems code: Crash-test N-body simulations,* Di Cintio, P., Pasquato, M., Kim, H.-W., Yoon, S.-J. 2020, A&A Submitted, astro-ph: 2006.16018
4. *Dissecting machine-learning models for AGN-spectra classification with interpretability tools*, Peruzzi, T., Pasquato M., , Ciroi, S., Berton, M., Marziani, P., Nardini, E. 2020, A&A Submitted

Accepted
1. *Taking apart the dynamical clock: Fat-tailed dynamical kicks shape the blue-straggler star bimodality,* Pasquato, M. & Di Cintio, P. 2020 A&A Accepted
2. *Measuring the spectral index of turbulent gas with deep learning from projected density maps,* Trevisan, P., Pasquato, M., Ballone, A., Mapelli, M. 2020 MNRAS Accepted

Published
1. *Different Fates of Young Star Clusters after Gas Expulsion* Pang, X.-Y., Li, Y.-Q., Tang, S.-Y., Pasquato, M., Kouwenhoven, M. B. N. 2020 ApJL 900, L4
2. *Binary black holes in young star clusters: the impact of metallicity* Di Carlo, U. N.; Mapelli, M.; Giacobbo, N.; Spera, M.; Bouffanais, Y.; Rastello, S.; Santoliquido, F.; Pasquato, M.; Ballone, A.; Trani, A. A.; Torniamenti, S.; Haardt, F. 2020 MNRAS 498, 495
3. *An astrophysically motivated ranking criterion for low-latency electromagnetic follow-up of gravitational wave events* Artale, M. C., Bouffanais, Y., Mapelli, M., Giacobbo, N., Sabha, N. B., Santoliquido, F., Pasquato, M., Spera, M. 2020 MNRAS 495, 1841
4. *Further properties of the dynamical clock A+ indicator in a toy model of pure dynamical friction,* Pasquato, M. 2019, RevMexAA 56, 7
5. *Analytical solutions for the dynamical clock A+ indicator in a toy model of pure dynamical friction,* Pasquato, M. 2019, RevMexAA 56, 3
6. *Mass and star formation rate of the host galaxies of compact binary mergers across cosmic time,* Artale M. C., Mapelli M., Bouffanais, Y., Giacobbo, N., Spera, M., Pasquato M. 2020, MNRAS 491, 3419
7. *Clustering clusters: unsupervised machine learning on globular cluster structural parameters,* Pasquato, M. & Chung, C. 2019, MNRAS, 490, 3392
8. *Radial Dependence of the Proto-Globular Cluster Contribution to the Milky Way Formation,* Chung, C., Pasquato, M., Lee, S.-Y., Di Carlo, U.N., An, D., Yoon, S.-J., Lee, Y.-W. 2019 ApJL 883, L31
9. *Extended halo of NGC 2682 (M 67) from Gaia DR2,* Carrera, R., Pasquato, M., Vallenari, A., Balaguer-Núñez, L., Cantat-Gaudin, T., Mapelli, M., Bragaglia, A., Bossini, D., Jordi, C., Galadí-Enríquez, D., Solano, E. 2019, A&A, 627, A119
10. *Finding Black Holes with Black Boxes - Using Machine Learning to Identify Globular Clusters with Black Hole Subsystems,* Askar, A., Askar, A., Pasquato, M. & Giersz, M. 2019, MNRAS, 485, 5345
11. *Merging black holes in young star clusters* Di Carlo, U. N., Giacobbo, N., Mapelli, M., Pasquato, M., Spera, M., Wang, L. & Haardt, F. 2019, MNRAS, 487, 2947
12. *Weighing the IMBH candidate CO-0.40-0.22* in the Galactic Centre,* Ballone, A., Mapelli, M. & Pasquato, M. 2018, MNRAS, 480, 4684
13. *Blue Straggler Bimodality: A Brownian Motion Model* Pasquato, M., Miocchi, P. & Yoon, S.-J. 2018, ApJ, 867, 163
14. *Science with e-ASTROGAM. A space mission for MeV-GeV gamma-ray astrophysics,* de Angelis, A., [...], Pasquato, M., [...], & E-Astrogam Collaboration 2018, JHEAp, 19, 1
15. *Reversed Trend of Radial Distribution of Subpopulations in the Globular Clusters NGC 362 and NGC 6723,* Lim, D., Lee, Y.-W., Pasquato, M., Han, S.-I. & Roh, D.-G. 2016, ApJ, 832, 99
16. *Globular Clusters Hosting Intermediate-Mass Black Holes: No Mass-Segregation Based Candidates,* Pasquato, M., Miocchi, P., Won, S. B. & Lee, Y.-W. 2016, ApJ, 823, 135
17. *Merged or monolithic? Using machine-learning to reconstruct the dynamical history of simulated star clusters,* Pasquato, M. & Chung, C. 2016, A&A, 589, A95
18. *On the use of the number count of blue horizontal branch stars to infer the dominant building blocks of the Milky Way halo* Chung, C., Lee, Y.-W. & Pasquato, M. 2016, MNRAS, 456, L1
19. *Probing the Role of Dynamical Friction in Shaping the BSS Radial Distribution. I. Semi-analytical Models and Preliminary N-body Simulations,* Miocchi, P., Pasquato, M., Lanzoni, B., Ferraro, F. R., Dalessandro, E., Vesperini, E., Alessandrini, E. & Lee, Y.-W. 2015, ApJ, 799, 44

20. *Stellar Encounter Driven Red-giant Star Mass Loss in Globular Clusters,* Pasquato, M., de Luca, A., Raimondo, G., Carini, R., Moraghan, A., Chung, C., Brocato, E. & Lee, Y.-W. 2014, ApJ, 789, 28
21. *Star Count Density Profiles and Structural Parameters of 26 Galactic Globular Clusters,* Miocchi, P., Lanzoni, B., Ferraro, F.R., Dalessandro, E., Vesperini, E., Pasquato, M., Beccari, G., Pallanca, C. & Sanna, N. 2013, ApJ, 774, 151
22. *Core collapse and horizontal-branch morphology in Galactic globular clusters,* Pasquato, M., Raimondo, G., Brocato, E., Chung, C., Moraghan, A. & Lee, Y.-W. 2013, A&A, 554, A129
23. *Dynamical age differences among coeval star clusters as revealed by blue stragglers,* Ferraro, F. R., Lanzoni, B., Dalessandro, E., Beccari, G., Pasquato, M., Miocchi, P., Rood, R. T., Sigurdsson, S., Sills, A., Vesperini, E., Mapelli, M., Contreras, R., Sanna, N. & Mucciarelli, A. 2012, Nature, 492, 393
24. *The Binary Fraction in the Globular Cluster M10 (NGC 6254): Comparing Core and Outer Regions* Dalessandro, E., Lanzoni, B., Beccari, G., Sollima, A., Ferraro, F. R. & Pasquato, M. 2011, ApJ, 743, 11
25. *The Dynamical State of the Globular Cluster M10 (NGC 6254)* Beccari, G., Pasquato, M., De Marchi, G., Dalessandro, E., Trenti, M. & Gill, M. 2010, ApJ, 713, 194
26. *On the fundamental line of galactic and extragalactic globular clusters,* Pasquato, M. & Bertin, G. 2010, A&A, 512, A35
27. *Tidal Disruption, Global Mass Function, and Structural Parameter Evolution in Star Clusters,* Trenti, M., Vesperini, E. & Pasquato, M. 2010, ApJ, 708, 1598
28. *Mass Segregation in NGC 2298: Limits on the Presence of an Intermediate Mass Black Hole* Pasquato, M., Trenti, M., De Marchi, G., Gill, M., Hamilton, D. P., Miller, M. C., Stiavelli, M. & van der Marel, R. P. 2009, ApJ, 699, 1511
29. *On the Fundamental Plane of the Galactic globular cluster system*, Pasquato, M. & Bertin, G. 2008, A&A, 489, 1079

Selected proceedings and other non-peer reviewed publications

Quasi-experimental Approach to Open Cluster Dynamics, Pasquato, M. & Matsiuk, N. 2019 RNAAS 3, 11
Kinematics of Globular Clusters: new Perspectives of Energy Equipartition from N-body Simulations, Kim, H., Pasquato, M. & Yoon, S.-J. 2018, AAS Meeting Abstracts 231, 448.02
Building blocks of the Milky Way halo Chung, C., Lee, Y.-W. & Pasquato, M. 2016, MMSAIt, 87, 681.
Detecting intermediate mass black holes in globular clusters with machine learning, Pasquato, M. 2016, MMSAIt, 87, 571
Croatian Black Hole School 2010 lecture notes on IMBHs in GCs, Pasquato, M. 2010, astro-ph:1008.4477
Looking for Intermediate Mass Black Holes in GCs: the mass-segregation method, Pasquato, M. 2010, MMSAIt, 14, 59
What Mass Segregation in NGC 2298 Says About the Presence of an IMBH Gill, M., Trenti, M., Pasquato, M. & Miller, M. 2009, AAS Meeting Abstracts 213, 437.03

Recent Conferences, talks and workshops

Invited: *Ringberg Workshop on Machine Learning in Astronomy*, Ringberg, Germany 08-13/12/2019
Artificial Intelligence in Astronomy, ESO Garching, Germany 22/07/2019 – 26/07/2019. Talk title: *Image-in science out? A proof of concept with deep learning on molecular cloud simulations.*
Galaxy Coffee, MPIA Heidelberg, Germany 18/07/2019 - all expenses paid by MPIA as I visited Dr. Alessandra Mastrobuono Battisti and Dr. Anna Sippel from 15/07/2019 to 19/07/2019. I also gave talks at Prof. H.-W. Rix (MPIA Heidelberg director), Dr. Annalisa Pillepich, and Prof. Nadine Neumeier group meetings. Talk title: *Applying machine learning to astronomy, beyond simple classification towards automatic science*
KASI Colloquium, Korea Astronomy and Space Science Institute, Korea 11/06/2019. Talk title: *Cluster analysis for multiple populations in GCs – NGC 2808 as a case study*
IAU Symposium 351 & MODEST-19, INAF Bologna, Italy, 27/05/2019 – 31/05/2019. Poster title: *Finding IMBHs with machine learning: encouraging results*
MODEST-18, Santorini, Greece, 25/06/2018 – 29/06/2018. Talk title: *Finding IMBHs in Star Clusters with Machine Learning*

Selected references

Prof. Michela Mapelli, associate professor, Padua University, department of Physics and Astronomy
Email: michela.mapelli@unipd.it   Office Phone: +39 0498278220
Prof. Mapelli is my Marie Curie fellowship host and we co-authored six papers, including one in Nature. She is the PI of the DEMOBLACK (Demography of Black Hole Binaries in the Era of Gravitational Wave Astronomy) ERC consolidator grant worth 1994764 EUR (~2200000 USD) for the 2018 – 2023 period by the European Research Council. She can provide information on my mentoring activity at Padua University.

Prof. Antonella Vallenari, staff astronomer, Padua Observatory, National Astrophysics Institute
Email: antonella.vallenari@oapd.inaf.it   Office Phone: +390498293 429
Prof. Vallenari is Deputy Chair of the Gaia Data Processing and Analysis Consortium Executive (DPACE). I contributed (with dynamics calculations and Bayesian parallax inversion) to a paper by her group on the three-dimensional shape of the extended halo of the open cluster M67 and I am working on a follow-up paper using direct N-body simulations to model the effects of Galactic disk shocking on M67.

Prof. Suk Jin Yoon, full professor, Yonsei University
Email: sjyoon0691@yonsei.ac.kr   Office Phone: +82221235689
Prof. Yoon is my former host at Yonsei University. We are co-authors in three papers and he can provide information on my teaching and mentoring activity at Yonsei.