Giuliano Iorio

Curriculum Vitae

Personal Information

Name	Giuliano
Age	30
Birth date	13/06/1989
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Work experiences

11/2019–Ongoing **Postdoc researcher (DEMOBLACK ERC project)**, *Dipartimento di Fisica e Astronomia, University of Padova*, I am currently working in the DEMOBLACK group lead by Prof. Michela Mapelli. My main focus is the development of the population-synthesis code SEVN and its integration in the AMUSE framework. Meanwhile, I am using the code to explore what are the physical processes that could be important in the formation and evolution of black hole binaries..

04/2018–11/2019 **Postdoc researcher (Newton International Fellow)**, *Institute of Astronomy, University of Cambridge*, I worked as an independent researcher collaborating with Prof. V. Belokurov and its group. My research focused on the exploitation of the unprecedented dataset obtained with the Gaia Satellite. In particular, I studied the structure and properties of the Galactic stellar halo with the aim to recover clues about the formation of our Galaxy..

Education

2014–2018 **PhD in Astrophysics**, *University of Bologna*.
Dissertation: "Off piste" beyond the disc of the Milky Way. Structure of the stellar halo and dynamics of nearby dwarf galaxies

2011–2014 **Master Degree in Astrophysics and Cosmology**, *University of Bologna*, *110/110 cum laude*.
Dissertation: The thickness of gaseous layer in disk galaxies.

2008–2011 **Bachelor of Astronomy**, *University of Bologna*, *110/110 cum laude*.
Dissertation: Dynamic of spiral and elliptical galaxies.

Schools/Courses

09/2018-Ongoing **Blockhain - An introduction to Hyperledger technologies**, *The Linux Foundation*, online course (edX).
Topics: blockchain and distributed ledger technologies, Hyperledger Composer, Hyperledger Sawtooth and Hyperledger Fabric frameworks

09/2018-12/2018 **Machine learning**, *Standford University*, online course (Coursera).
Topics: machine learning theory and supervised (linear regression, logistic regression, neural network, support vector machines) and unsupervised (k-means, principal component analysis) machine learning techniques

05/2016 **PhD School of Astrophysics "Francesco Lucchin"**, Napoli.
Topics: Stellar explosions novel and rarity; Cosmology with large surveys.

10/2015 **PhD School of Astrophysics "Francesco Lucchin"**, Erice.
Topic: Science and Technology with E-ELT

06/2015 **24th Summer school on Parallel Computing**, CINECA,Bologna.

05/2015 **PhD School of Astrophysics "Francesco Lucchin"**, Populonia.
Topics: The chemical complexity of the Universe with ALMA; The Galactic centre.

PhD Lectures

06/2017 **A multi-wavelength view of the Galactic Center**, Bologna.

06/2016 **What we can learn from Gaia**, Bologna.

04/2015 **Bayesian Methods in Astrophysics**, Bologna.

02/2015 **Introduction to C++ via Vconf**, Bologna.

Awards and Job offers

10/2018 **Newton International Fellowship**, *Royal society*.
Awarded of one of the 40 international fellowships by the Royal Society.

10/2018 **Post-doc position**, *University of Bologna*.
I got a job offer from the University of Bologna founded by energy company ENI to analyse time-series statistics of geological detectors. I refused the position to start the Newton Internal Fellowship.

Languages

Italian **Native speaker**

English **Very Good**

Skills

Advanced	Team work, Problem solving, Mathematics, Bayesian statics, Data modelling, Quick learner, Multi-tasking, Flexibility
Intermediate	Machine Learning
Basic	Deep Learning, Blockchain technologies

Computational skills

Intermediate	Parallel computing (CPUs)
Basic	Parallel computing (GPUs)

Programming and scripting

Advanced	Python, Cython
Intermediate	C++, C, SQL (PostgreSql), Fortran, MPI, OpenMP
Basic	Mathematica, Matlab, NOSQL (MONGODB), Swift, IDL, Julia, CUDA, Bash scripting

Scientific Softwares

Advanced	Gipsy, 3DBAROLO, Gadget-2, LaTeX
Intermediate	Topcat, KARMA, DS9
Basic	AIPS, IRAF, CASA

Other Softwares

Advanced	Word Processors (WORD, PAGES), Spreadsheets (EXCEL, NUMBERS, CALC)

Cloud

Advanced	Git, Dropbox, ICloud, Google Drive
Basic	Amazon AWS

Experiences

Collaborations

09/2019–Ongoing	Collaboration with the marketing group MARKLAB at University of Cassino as data analyst.

Events Organisation

11/2017	SOC/LOC for the internal PhD school "Python for Astrophysics" at University of Bologna.

Visiting

02/2019	I spent a period of a week as invited visitor at Kapteyn Institute (University of Groningen, Netherlands) invited by Prof. F. Fraternali.
05/2018	I spent a period of two weeks as a visitors at CCA (Centre for Computational Astrophysics) at Flatiron Institute in New York (USA) hosted by Prof. V. Belokurov.
03/2017	I spent a period of a week as a visitors at Research School of Astronomy and Astrophysics in Canberra (Australia).

09/2016-12/2016 I spent a period of three months as visiting PhD student at Institute of Astronomy (University of Cambridge) under the supervision of Prof. V. Belokurov.

Teaching

10/2018–11/2018 Supervision of 8 students for the course *Stellar Dynamics and Structure of Galaxies*, Astrophysics Part II, University of Cambridge.

11/2017 Lecture "An introduction to CYTHON" during the internal PhD school "Python for Astrophysics" at University of Bologna. Link to the slides.

03/2015 Lecture about HI data analysis in the master course "Gas dynamics in galaxies" taught by Prof. F. Fraternali, University of Bologna.Link to the slides.

05/2013 Brief astronomy lesson held at Primary School in Pontecorvo, Italy.

Supervision

2015 Co-Supervisor of Cecilia Bacchini (awarded cum laude) for her master thesis "Gas accretion and galactic fountains in disc galaxies".

Conferences and Workshops

07/2019 **Small Galaxies, Cosmisc Questions**, Durham, UK.
Talk: The effect of tides on the Scultpor dSph Link to the slides.

03/2019 **Gaia Sprint 2019**, Santa Barbara, USA.
Project: RR Lyrae stars in Pal5 stellar stream. Link to the pitch slides; Link to the wrap-up slides.

12/2018 **Near-Field Cosmology in the Era of Large Surveys**, Santiago, Chile.
Talk: The shape of the Galactic halo with Gaia RR Lyrae. Anatomy of an ancient major merger. Link to the slides.

11/2018 **The lifes and times of the Milky Way**, Shanghai, China.
Talk: The shape of the Galactic halo with Gaia RR Lyrae. Anatomy of an ancient major merger. Link to the slides.

07/2018 **Stellar halos across the cosmos**, Heidelberg, Germany.
Talk: A first Gaia look to the Galactic stellar halo. Link to the slides.

09/2017 **The science of Gaia and future challenge**, Lund, Sweden.
Talk: A First Gaia look at the inner halo. Link to the slides.

07/2017 **GREAT**, *Ewass 2017*, Prague, Czech Rep..
Talk: A First Gaia look at the inner halo.

03/2017 **From Field to Clusters: HI as a tracer for galaxy evolution**, Swinburne University of Technology, Melbourne, Australia.
Talk: Little Things in 3D: Kinematics of the HI discs in dwarf irregular galaxies.

01/2017 **Bright & Dark Universe**, INAF Osservatorio Astronomico di Capodimonte,Naples, Italy.
Poster: Little Things in 3D: Kinematics of the HI discs in dwarf irregular galaxies.

07/2016 **Discs in galaxies**, *Munich Joint Conference*, Garching, Germany.
Poster: Little Things in 3D: Kinematics of the HI discs in dwarf irregular galaxies.

06/2015 **The Journey of Dwarf Galaxies**, *Ewass 2015*, La Laguna, Tenerife, Spain.
Poster: Dynamics of the dwarf irregular galaxies in the Local Group: a 3D self consistent approach. Link to the abstract.

10/2013 **Multi-spin Galaxies**, INAF Osservatorio Astronomico di Capodimonte,Naples, Italy.

05/2013 **LVII Congresso SAIT**, CNR,Bologna, Italy, 57° Meeting of the Italian Astronomical Sociery.

Media & Press Coverage

01/2019 Physics Today: An ancient merger helped form our Galaxy.

Publications

2019 **The effect of tides on the Sculptor dwarf spheroidal galaxy**, **G. Iorio**, C. Nipoti, G. Battaglia, A. Sollima, 2019, MNRAS, 487, 5692.
http://adsabs.harvard.edu/abs/2019MNRAS.487.5692I

2019 **The shape of the Galactic halo with *Gaia* DR2 RR Lyrae. Anatomy of an ancient major merger**, **G. Iorio**, V. Belokurov, 2019, MNRAS, 482, 3868.
http://adsabs.harvard.edu/abs/2019MNRAS.482.3868I

2018 **The first all-sky view of the Milky Way stellar halo with *Gaia*+2MASS RR Lyrae**, **G. Iorio**, V. Belokurov, D. Erkal, C. Nipoti, F. Fraternali, 2018, MNRAS, 474, 2142.
http://adsabs.harvard.edu/abs/2018MNRAS.474.2142I

2017 **LITTLE THINGS in 3D: robust determination of the circular velocity of dwarf irregular galaxies**, **G. Iorio**, F. Fraternali, C. Nipoti, E. Di Teodoro, J.I. Read, G. Battaglia, 2017, MNRAS, 466, 4159.
http://adsabs.harvard.edu/abs/2017MNRAS.466.4159I

2019 **Kinematics of the Palomar 5 stellar stream from RR Lyrae stars**, A. Price-Whelan, C. Mateu, **G. Iorio**, S. Pearson, A. Bonaca, V. Belokurov, 2019, AJ, 158, 223.
https://ui.adsabs.harvard.edu/abs/2019AJ....158..223P

2019 **Kinematic and metallicity properties of the Aquarius dwarf galaxy from FORS2 MXU spectroscopy**, L. Hermosa Munoz, S. Taibi, G. Battaglia, **G. Iorio** et al., submitted to A&A.

2019 **The volumetric star formation law in the Milky Way**, C. Bacchini, F. Fraternali, G. Pezzulli, A. Marasco, **G. Iorio**, C. Nipoti, submitted to A&A.

2019 **Evidence for two early accretion events that built the Milky Way stellar halo**, G.C. Myeong, E. Vasiliev, **G. Iorio**, N.W. Evans, V. Belokurov, 2019, MNRAS, 488, 1235.
http://adsabs.harvard.edu/abs/2019MNRAS.488.1235M

2019 **Volumetric Star Formation laws of disc galaxies**, C. Bacchini, F. Fraternali, **G. Iorio**, G. Pezzulli, 2019, A&A, 622, A64.
http://adsabs.harvard.edu/abs/2018arXiv181003616B

2019 **A Magellanic origin for the Virgo sub-structure**, D. Boubert, V. Belokurov, D. Erkal, **G. Iorio**, 2019, MNRAS, 482, 4562.
http://adsabs.harvard.edu/abs/2019MNRAS.482.4562B

2018 **S0 galaxies are faded spirals: clues from their angular momentum content**, F. Rizzo, F. Fraternali, **G. Iorio**, 2018, MNRAS, 476, 2137.
http://adsabs.harvard.edu/abs/2018MNRAS.476.2137R

2017 **The stellar mass-halo mass relation of isolated field dwarfs: a critical test of ΛCDM at the edge of galaxy formation**, J.I. Read, **G. Iorio**, O. Agertz, F. Fraternali, 2017, MNRAS, 467, 2019.
http://adsabs.harvard.edu/abs/2017MNRAS.467.2019R

2016 **Understanding the shape and diversity of dwarf galaxy rotation curves in ΛCDM**, J.I. Read, **G. Iorio**, O. Agertz, F. Fraternali, 2016, MNRAS, 462, 3628.
http://adsabs.harvard.edu/abs/2016MNRAS.462.3628R

PhD Thesis

Title *"Off piste" beyond the disc of the Milky Way: Structure of the stellar halo and dynamics of nearby dwarf galaxies*

Supervisors Prof. Carlo Nipoti, Prof. Filippo Fraternali, Dr. Giuseppina Battaglia

Description In this thesis we have exploited state-of-the-art datasets and techniques and/or proposed new methods to study the matter distribution in the stellar halo of our Galaxy and to study the kinematics and dynamics properties of a sample of nearby dwarf irregular galaxies (dIrrs). Click here to download the thesis

Master Thesis

Title *The thickness of gaseous layer in disk galaxies.*

Supervisor Prof. Filippo Fraternali

Description In this thesis I developed a method to measure the thickness of the HI layer in non edge-on disc galaxies. Click here to download the thesis