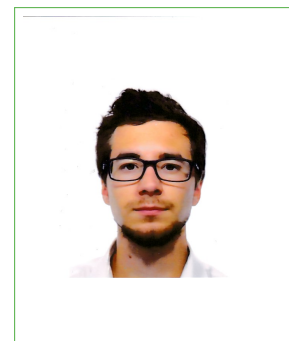


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Experience

- 2023–Present **Postdoctoral Researcher**
INAF - Osservatorio Astronomico di Padova, Padova, Italy
- 2019–2023 **PhD student in Astronomy**
Università degli Studi di Padova, Padova, Italy
○ Final evaluation (03/04/2023) magna cum laude
- 2017–2019 **Master's Degree in Astronomy**
Università degli Studi di Padova, Padova, Italy
○ Final evaluation (26/09/2019) 110/110 magna cum laude
- 2014–2017 **Bachelor's Degree in Astronomy**
Università degli Studi di Padova, Padova, Italy
○ Final evaluation (07/09/2017) 108/110
- 2009–2014 **High School Diploma**
Liceo Scientifico Enrico Fermi, Padova, Italy
○ Final evaluation (02/07/2014) 100/100

Thesis projects

- PhD thesis** **Expanding the sample of Electron Capture Supernova Candidates**
Accepted on 2023-02-24
In the context of the search for a genuine Electron Capture Supernova (ECSN) event, we present the photometric and spectroscopic follow-up of two Low Luminosity Supernovae Type IIP (SN 2020cxd, SN 2021aai) and four Intermediate Luminosity Red Transients (ILRTs), namely NGC 300 2008OT-1, AT 2019abn, AT 2019ahd, AT 2019udc. SN 2021aai is a transitional object, linking the family of faint SNe IIP with the standard SNe IIP. Its progenitor star, characterised through hydrodynamical modelling, is most likely a red supergiant. SN 2020cxd is faint even among the low luminosity SNe subclass, and is compatible both with an iron core collapse from a low mass red supergiant and with an electron capture supernova event. As for ILRTs, their photometric properties can vary significantly in peak magnitude and decline rates. We identified for the first time broad features in the late time spectra of NGC 300 2008OT-1 and AT 2019ahd, possibly linked with emission lines produced by fast Nickel. In this scenario, ILRTs appear to be remarkably strong candidates for being genuine ECSN events.
Supervisor: Dr. Andrea Pastorello

Papers linked with the PhD thesis:

- 1) Valerin, G., Pumo, M. L., Pastorello, A. et al. *Low luminosity Type II supernovae - IV. SN 2020cxd and SN 2021aai, at the edges of the sub-luminous supernovae class*, Monthly Notices of the Royal Astronomical Society, 2022
- 2) Valerin, G., Pastorello, A., Reguitti, A. et al. *Intermediate Luminosity Red Transients I - Photometric properties* (To be submitted to MNRAS)
- 3) Valerin, G., Pastorello, A., Reguitti, A. et al. *Intermediate Luminosity Red Transients II - Spectroscopic properties* (To be submitted to MNRAS)

Master thesis **NGC3000T: Stellar Outburst or Electron Capture Supernova?**
This thesis focuses on the Intermediate Luminosity Red Transient NGC3000T: new photometry and spectra are compared with data published in the literature, and we discuss whether the properties of this object are more compatible with a non terminal eruption or with a faint supernova event.
Supervisor: Dr. Andrea Pastorello

Bachelor thesis **Type Ia Supernovae: Progenitors and Nucleosynthesis**
In this compilation work we review the "Single Degenerate" and "Double Degenerate" scenarios for type Ia Supernovae, focusing in particular on dynamical models of the progenitor systems, observed rates of supernova events and galactic heavy elements abundance.
Supervisor: Prof. Paola Marigo

Awarded Observational Time

- 2023-2024 **Characterising the elusive interacting transients**
Long term program at Telescopio Nazionale Galileo (TNG) and Rapid Eye Mount (REM) telescope. A total of 90 hours at TNG and 300 hours at REM were awarded as P.I. (AOT47 - 48 - 49).
- 2021-2022 **Exploring the diverse landscape of interacting transients**
Long term program at Telescopio Nazionale Galileo (TNG) and Rapid Eye Mount (REM) telescope. A total of 60 hours at TNG and 300 hours at REM were awarded as P.I. (AOT44 - 45 - 46).
- 2022 **Monitoring the erratic variability of Luminous Blue Variables and interacting Supernovae with the Asiago Schmidt telescope**
10 hours per month with Asiago and Schmidt Telescopes. Co-I (P.I.: Andrea Reguitti)
- 2022 **Nearby and Strongly-interacting Supernovae**
16 nights awarded with Asiago Telescope equipped with AFOSC. Co-I (P.I.: Irene Salmaso)
- 2021 **Looking at the Gap Transients from a new perspective**
18.7 hours with Gran Telescopio Canarias. Co-I (P.I.: Nancy Elias-Rosa)
- 2021 **Intermediate-luminosity optical transients and interacting supernovae**
30 hours with the Liverpool Telescope. Co-I (P.I.: Paolo Mazzali)
- 2019-2020 **Investigating gap transients and interacting supernovae**
6 nights with Nordic Optical Telescope. Co-I (P.I.: Andrea Pastorello)

PhD schools and courses

- 2022 Summer School in Astroinformatics II, Center for Astrostatistics at The Pennsylvania State University
- 2021 Summer School on The Interstellar Medium of Galaxies, from the Epoch of Reionization to the Milky Way
- 2021 Course on Characterization of Astronomical Sites, by Prof. S. Ortolani
- 2021 Course on Interstellar Medium component, by Prof. G. Carraro
- 2021 Course on Stellar Populations, by Dr. L. Greggio
- 2021 Course on Project Management, by Dr. M. Bergomi
- 2021 Monographic course on Scaling Relations of Galaxies, by Prof. M. D'Onofrio
- 2021 Monographic course on Supernovae, by Dr. A. Pastorello
- 2020 Monographic course on Paper Publishing, by Dr. C. Sneden

Other Professional Contributions

- 2024 Reviewer for The Astrophysical Journal.
- 2023 Reviewer for The Astrophysical Journal.
- 2022 Reviewer for AOT47 cycle proposals at Telescopio Nazionale Galileo.
- 2022 Reviewer for The Astrophysical Journal.
- 2022 Speaker during the "European Researchers' Night" at INAF-OAPD. Title of the talk: "Stars, the beacons of the Cosmos".
- 2022 Speaker at the Sexten Workshop on "GAP Transients/Intermediate Luminosity Optical Transients: giant eruptions or stellar mergers". Title of the talk: "Intermediate Luminosity Red Transients"
- 2021 Reviewer for AOT44 cycle proposals at Telescopio Nazionale Galileo.
- 2020 Interviewed during the "European Researchers' Night".
- 2017 Calculus I tutor for first year Astronomy students for a total of 50 hours.

Awards

- 2016-2017 Awarded with the "Mille e una lode" scholarship prize during the Academic year 2016/2017 for being ranked in the 97th percentile of grades among the Astronomy course of the Padova University.

Publications summary

15 refereed articles published, which received over 60 citations, 3600 reads and 1800 downloads. These articles are available at the following ADS library:

<https://ui.adsabs.harvard.edu/public-libraries/7bgBop81Q120IBmyyApDzg>

Accounting also for non-refereed publications, the total number of publications adds up to 27, with over 70 papers citing these works, over 4200 reads and 2000 downloads. The resulting H-index is 7. These articles are available at the following ADS library:

<https://ui.adsabs.harvard.edu/public-libraries/a.WA64K6T5uoL4LvJZJ9Uw>

Additional research experience

2018 **Lifetimes measurements in nuclei close to ^{78}Ni** , *Internship at LNL (Laboratori Nazionali di Legnaro)*

Important information about the nuclear wave function can be obtained knowing the mean lifetime of the nuclear states as well as the energy, multipolarity and parity of the emitted photon. In this project we estimated the lifetimes of excited nuclear states in neutron-rich nuclei through γ -spectroscopy.

Supervisor: Dr. Andrea Gottardo

Personal skills

Languages

Italian: mother tongue

English: proficient (C2 level reading and writing, C1 level spoken production)

Computer skills

LaTeX: proficient

Python: proficient

IRAF: competent

Driving licence

B

Contact information

Dr. Andrea Pastorello

INAF - Osservatorio Astronomico di Padova, Vicolo dell'Osservatorio 5, I-35122 Padova, Italy

Prof. Paola Marigo

Dipartimento di Fisica e Astronomia, Università degli Studi di Padova, Padova, Vicolo dell'Osservatorio 3, I-35122 Padova, Italy

Dr. Andrea Gottardo

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