

Sara Santoni

Nationality: Italian

ABOUT ME

My research is focused on the study of large-scale structures. I am interested in the interplay between galaxy clusters and filaments of the Cosmic Web, particularly how the presence of filaments correlates with the properties of galaxy clusters. My expertise lies in hydrodynamical simulations, with a particular focus on The Three Hundred simulation, and in the identification of filaments from gas and galaxy catalogues, and multi-wavelength observations through the use of the filament finder DisPerSE.

EDUCATION AND TRAINING

- [01/11/2022 – 11/12/2025] **PhD in Astronomy, Astrophysics and Space Science**
Joint CIVIS PhD between Sapienza University of Rome and Universidad Autónoma de Madrid
City: Rome | **Country:** Italy | | **Thesis:** Study of the impact of filaments on clusters of galaxies by hydrodynamic simulations and multi-wavelength observations
- [01/09/2020 – 29/09/2022] **Master degree in Astronomy and Astrophysics**
Sapienza University of Rome
City: Rome | **Country:** Italy | | **Final grade:** 110 cum laude/110
- [09/2017 – 10/2020] **Bachelor degree in Physics**
Sapienza University of Rome
City: Rome | **Country:** Italy | | **Final grade:** 110/110

NETWORKS AND MEMBERSHIPS

- [03/2022 – Current] **The Three Hundred collaboration**
Coordinator of the Filaments science working group since July 2023

HONOURS AND AWARDS

- [11/2023] **Grant "Avvio Alla Ricerca Tipo 1" [PI], 2000 € Awarding institution:** Sapienza University of Rome
Initial Research Project Type 1, "Impact of filamentary structures on galaxy clusters properties in hydrodynamical simulations"
- [10/2023] **PhD Students Mobility Call, 2100 € Awarding institution:** Sapienza University of Rome
Competitive call for the financing of mobility abroad of PhD student
- [05/2022] **International Thesis Scholarship, 2600 € Awarding institution:** Sapienza University of Rome
Scholarship issued to conduct part of the master thesis research at Universidad Autónoma de Madrid

[2021] **Astronomy Master Honours Scholarship Awarding institution:** Sapienza University of Rome

Program promoted by individual faculties through annual calls. Students are admitted to the program based on merit and can take part in additional educational activities

PUBLICATIONS

[2024] [THE THREE HUNDRED project: Estimating the dependence of gas filaments on the mass of galaxy clusters](#)

Authors: Sara Santoni, Marco De Petris, Gustavo Yepes, Antonio Ferragamo, Matteo Bianconi, Meghan E. Gray, Ulrike Kuchner, Frazer R. Pearce, Weiguang Cui, and Stefano Ettori | **Journal Name:** Astronomy and Astrophysics | **Volume, Issue and Pages:** 692, A44

[2024] [Impact of filaments on galaxy cluster properties in The Three Hundred simulation](#)

Authors: Sara Santoni, Marco De Petris, Antonio Ferragamo, Gustavo Yepes, and Weiguang Cui | **Journal Name:** mm Universe 2023 - Observing the Universe at mm Wavelengths | **Volume, Issue and Pages:** Vol. 293, 00048, p.00048 | **Publisher:** European Physical Journal Web of Conferences

[2025] [The Atacama Cosmology Telescope: a census of bridges between galaxy clusters](#)

Authors: G. Isopi et al. (including S. Santoni) | **Journal Name:** Journal of Cosmology and Astroparticle Physics | **Volume, Issue and Pages:** 2025.8, 078

CONFERENCES AND SEMINARS

[15/09/2025 – 19/09/2025] **Astronomy, Astrophysics and Space Science PhD workshop** Rome, Italy

Contributed talk

[07/07/2025 – 11/07/2025] **Tracing Cosmic Evolution with Galaxy Clusters V** Sesto, Italy

Poster

[29/06/2025 – 04/07/2025] **The Three Hundred collaboration annual meeting** Trim, Ireland

Contributed talk

[14/04/2025 – 16/04/2025] **UniVersum VI** Padova, Italy

Contributed talk

[01/04/2025 – 03/04/2025] **XMM Data Analysis Workshop** Online, ESA Science Observation Centre

Workshop participant

[16/09/2024 – 20/09/2024] **Astronomy, Astrophysics and Space Science PhD workshop** Rome, Italy

Contributed talk

[10/09/2024 – 13/09/2024] **CLUSTER4** Trieste, Italy

Contributed talk

[08/07/2024 – 12/07/2024] **The Three Hundred collaboration annual meeting** Madrid, Spain

Contributed talk

[01/07/2024 – 05/07/2024] **EAS Annual meeting 2024** Padova, Italy

Contributed talk

- [29/05/2024 – 31/05/2024] **UAM Semana del Doctorado 2024** Madrid, Spain
Contributed speaker and Poster
- [25/03/2024 – 27/03/2024] **IberiCOS 2024** Salamanca, Spain
Contributed talk
- [10/07/2023 – 14/07/2023] **EAS annual meeting 2023** Krakow, Poland
ePoster and flash talk
- [03/07/2023 – 07/07/2023] **The Three Hundred collaboration annual meeting** Tenerife, Spain
Contributed talk
- [26/06/2023 – 30/06/2023] **mm Universe 2023** Grenoble, France
Contributed talk
- [01/07/2022 – 05/07/2022] **The Three Hundred collaboration annual meeting** Madrid, Spain
Contributed talk

SKILLS

Programming

Bash script | C++ | C | Python

O.S.

MacOS | GNU/Linux | Windows

Scientific Software

TOPCAT | DisPerSE | VScode | R | MATLAB | Jupyter Notebook

Other Software

LateX | Microsoft Office

Research

analysis of hydrodynamic and N-body simulations | writing scientific articles | run simulations | astronomy | disseminate results to the scientific community | develop scientific theories | analyse scientific data

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Spanish

LISTENING B1 READING B2 WRITING B1

SPOKEN PRODUCTION B1 SPOKEN INTERACTION B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

RESEARCH EXPERIENCE

[19/05/2025 – 25/05/2025] **1 week visiting in Nottingham, UK**

Scientific visit to Prof. Gray and Prof. Pearce group to work on The Three Hundred collaboration.

I investigated the difference between the connectivity estimated from filaments identified using gas versus galactic tracers.

[02/2024 – 12/2024] **10 months stay in Madrid, Spain**

Mandatory stay for joint PhD agreement

[05/2022 – 07/2022] **2 months stay in Madrid, Spain**

Scientific stay funded with the International Thesis Scholarship of Sapienza University of Rome under the supervision of Prof. Gustavo Yepes.

OTHER EXPERIENCE

Quality Assurance Management Commission of PhD (CGAQ-PhD), Sapienza University of Rome

[09/2024 – Current]

Commission of Astronomy, Astrophysics and Space Science PhD to assess the quality of the PhD (as required per DM 47/2013)

[01/2024 – Current] **Student representative in PhD board**

Student representative in Astronomy, Astrophysics and Space Science PhD Board at Sapienza University of Rome

[11/2023 – 11/2024] **LOC and SOC of PhD Journal Club**

Organisation of the Astronomy, Astrophysics and Space Science PhD Journal Club

TEACHING AND TUTORING

[03/2023 – 09/2023] **Teaching assistant**

80 hours of teaching assistance for the course of Physics of Pharmacy degree program at Sapienza University of Rome

[2019 – 2022] **Library assistant**

300 hours of activity at the Department of Physics library

[2020 – 2021] **Physics SORT Help Desk assistant**

150 hours activity at the Department of Physics Sort Help Desk at Sapienza University of Rome

La sottoscritta dichiara di essere consapevole che il presente curriculum vitae sarà pubblicato sul sito istituzionale dell'Ateneo, nella Sezione "Amministrazione trasparente", nelle modalità e per la durata prevista dal d.lgs. n. 33/2013, art. 15.

ROMA, 29/10/2025