# Eda Gjergo, Ph.D.

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**Email**: eda.gjergo@gmail.com
**Phone**: +86(153) 2717-3735
**Web**: https://www.edagjergo.com
www.hep.anl.gov/egjergo

## Research interests

Galactic chemical evolution, dust modeling, cosmological simulations, interstellar and intracluster medium, supernova cosmology, dark energy models.

## Current employment

**Wuhan University** — Wuhan University
Postdoctoral Scholar in Physics — Oct 2019 - Present

## Education

**Università degli Studi di Trieste** — Trieste, Italy
PhD in Physics — Graduated in Spring 2019

**Illinois Institute of Technology (IIT)** — Chicago, IL
BS in Physics — Graduated in Spring 2014

**Illinois Institute of Technology (IIT)** — Chicago, IL
BS in Applied Mathematics — Graduated in Spring 2014

**United World College (UWC)** — Duino, Italy
International Baccalaureate (IB diploma programme) — Springs 2008

## Research experience

**Galactic Chemical Evolution at Wuhan University** — Oct '19 – Present

Developed a comprehensive modular Python package that computes the one-zone chemical evolution of galaxies in various environments. Currently applying it to the analysis of large databases of Galactic stellar abundances.

**INAF Astronomical Observatory of Trieste (Italy)** — Nov '15 – Sept '19

Adapted a one-zone dust evolution model to cosmological zoom-in simulations of galaxy clusters. • Became comfortable with running and editing complex parallel codes designed for supercomputers. • Developed a post-processing analysis package written in `Python` to extract and manipulate the simulation's data across cosmic history. • Wrote an algorithm to trace the evolution history of individual gas particles, as well as special subsets of the simulated particles across cosmic time. • Wrote automated python scripts to submit my post-processing routines to the supercomputer's queue, on top of the standard queuing procedure.

By integrating chemical evolution models over luminosity functions, shown that minor galaxies or filamentary structures ~ 1 dex smaller than the break of the Schechter functions cannot be major sources of galaxy cluster dust.

Through the post-processing radiative transfer analysis of cosmological zoom-in simulations of galaxies, analyzed spectral properties relevant to infrared surveys (i.e., SPICA).

**Argonne National Laboratory, (Chicago, IL)** Sept '11 – May '15

Aided to the coding the analysis framework of upcoming observations for the Dark Energy Survey (DES). Specifically, we improved the Figure of Merit by including the systematic error for core collapse supernovae.

Provided, on behalf of the DESC supernova group, the filter analysis of the candidate filter vendors able to meet LSST's specifications. The study played a major role in the vendor choice by the LSST committee.

Explored alternatives to dark energy: selected a model for quintessence and a model for modified gravity, and evaluated the constraints to three supernova data sets.

## Publications

**Disentangling heavy element production sources in the Galaxy**
*Gjergo* et al.; *In preparation, 2022.*

**The MAGPI Survey - science goals, design, observing strategy, early results and theoretical framework**
Foster, Mendel, Lagos, Wisnioski, Yuan et al.
*Submitted to: Publications of the Astronomical Society of Australia, 2021.*

**On the origin of dust in galaxy clusters at low-to-intermediate redshift**
*Gjergo*, Palla, Matteucci, Lacchin, Biviano, Fan
*Monthly Notices of the Royal Astronomical Society, 2020.*

**Dust evolution in galaxy cluster simulations**
*Gjergo*, Granato, Murante, Ragone-Figueroa, Tornatore, Borgani
*Monthly Notices of the Royal Astronomical Society, 2018.*

**Analytic photometric redshift estimator for Type Ia supernovae from the Large Synoptic Survey Telescope**
Wang, *Gjergo*, Kuhlmann
*Monthly Notices of the Royal Astronomical Society, 2015.*

**Type Ia supernovae selection and forecast of cosmology constraints for the Dark Energy Survey**
*Gjergo*, Duggan, Cunningham, Kuhlmann, Biswas, Kovacs, Bernstein, Spinka
*Astroparticle Physics, 2013.*

## Skills

**Programming**
Proficient in: **Python**, C, Mathematica.
Familiar with: MATLAB, C++, IDL, Fortran90/77.
Specialized software: GADGET-2/3, CosmoMC, SNANA, SNCosmo
Editor/Misc.: Emacs, Vi, SVN, TotalView, Anaconda.
Markup: HTML/CSS, LaTeX

**Languages**
(native) Italian, English, Albanian (HSK 2) Chinese

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| Invited Talks | GW NEXT 2022, Online Conference (Beijing, CN) | Jan '22 |
| | National Astronomical Observatory of China Seminar (Beijing, CN) | May '21 |
| | Kavli Institute for Astronomy & Astrophysics Seminar (Beijing, CN) | Nov '20 |
| | Beijing Normal University Seminar (Beijing, China) | Nov '19 |
| | 3rd International Workshop on Physics (Tirana, Albania) | 10/10/18 |
| | Invited lecturer (Università degli Studi di Trieste, Italy) | Spring '17, '18 |
| | 2nd International Workshop on Physics (Tirana, Albania) | 09/26/16 |
| | Invited lecturer at CARA outreach (Yerkes Observatory, WI) | 07/29/13 |
| Technical Talks | MAGPI Busyweek (online, Australia) | June '21 |
| | Hydrodynamical Simulations Meeting (Trieste, Italy) | Sep '16 |
| | LSST-DESC Collaboration Meeting (Pittsburgh, PA) | Dec '13 |
| | LSST DESC Supernovae Working Group (11 Webinars) | Spring '17-'18 |
| | DESSN Workshop (KICP at the University of Chicago, IL) | Jul '13 |
| Talks and posters | Interstellar Physics & Chemistry (Online conference, Zhuhai, China) | Jan '22 |
| | Origin of Elements and Cosmic Evolution (Beijing, China) | Nov '19 |
| | The Milky Way: LAMOST and other leading surveys (Yichang, China) | Oct '19 |
| | Second Italian Cluster Conference (Naples, Italy) | May '18 |
| | First Italian Cluster Conference (Turin, Italy) | Feb '17 |
| | KROME Computational school (Florence, Italy) | Jun '16 |
| | ICTP Workshop on Large-Scale Structure (Trieste, Italy) | Jun '16 |
| | ICTP Summer School of Cosmology (Trieste, Italy) | Jun '16 |
| | Lucchin astrophysics school (Naples, Italy) | May '16 |
| | AAS 223rd Meeting (Washington, D.C.) **Chambliss Hon. Mention** | Jan '14 |
| | Santa Fe Cosmology Workshop (Santa Fe, NM) | Jul '13 |
| | AAS 222nd Meeting (Indianapolis, IN) **Chambliss winner** | Jun '13 |
| | AAS 221st Meeting (Long Beach, CA) | Jan '13 |
| | ICTP Summer School of Cosmology (Trieste, Italy) | Jun '12 |
| | Chicagoland and Midwest 1-Day Dark Matter Workshop (Chicago, IL) | Apr '12 |
| | APS April Meeting (Atlanta, GA) | Apr '12 |
| Honors and scholarships | Chambliss Astronomy Achievement Student Award (AAS) | 2013 |
| | National Institute of Astrophysics Fellowship (INAF) | 2015-2018 |
| | Merit-based International Scholarship (IIT) | 2008-2014 |
| | Italian Ministry of Foreign Affairs Full Scholarship (UWC) (3.5% acceptance rate) | 2006-2008 |
| | Winner of the Frascati Scienza Award | 2010 |
| Service and outreach | Non-fiction bestseller *Così Parlano Le Stelle* | Apr '07 |
| | YouTube Astrophysics Outreach: TheCosmicWeb | Dec '12 – Feb '14 |