

Fabrizio Gentile

✉ fabrizio.gentile3@unibo.it

🌐 <https://www.unibo.it/sitoweb/fabrizio.gentile3/en/>

🆔 ORCID: [0000-0002-8008-9871](https://orcid.org/0000-0002-8008-9871)

Education

- 2021 - Today **📖 Ph.D. Student in Astrophysics**
Alma Mater Studiorum - University of Bologna
Thesis title: *Searching for high-redshift progenitors of massive galaxies*
Supervisors: Margherita Talia (UNIBO) & Andrea Cimatti (UNIBO)
- 2019 – 2021 **📖 M.Sc. in Physics (Astrophysics Curriculum)**
University of Naples "Federico II"
Thesis title: *Fast Automated Analysis of strong gravitational lenses in the forthcoming Euclid survey using machine-learning methods*
Supervisors: Crescenzo Tortora (INAF) & Giovanni Covone (UNINA)
- 2016 – 2019 **📖 B.Sc. in Physics**
University of Naples "Federico II"
Thesis title: *Searching for strong gravitational lenses with Convolutional Neural Networks*
Supervisors: Crescenzo Tortora (INAF) & Giovanni Covone (UNINA)

Skills

- Languages* **📖** Italian (native) • English (proficient)
- Computer skills* **📖** **Main developer** of two public codes for astrophysical analyses: LENS MOdelling with Neural networks (LEMON) and Photometry Extractor for Blended Objects (PhoEBO)
- 📖** Extensive use of the Windows and Linux/Unix Operative Systems
- 📖** Advanced knowledge of Python and its main libraries concerning astronomy (astropy, photutils), deep learning (keras, tensorflow), plotting (matplotlib, seaborn) and data analysis (numpy, scipy, pandas)
- 📖** Good knowledge of C, C++ and SQL
- 📖** Extensive use of the Microsoft Office suite
- 📖** Extensive use of L^AT_EX and Overleaf
- Technical skills* **📖** Photometry extraction with sEXTRACTOR, PHOTUTILS and THE FARMER
- 📖** Analysis of ALMA and NOEMA interferometric data with CASA (proficient) and GILDAS (basic)
- 📖** SED-Fitting with MAGPHYS, CIGALE, and BAGPIPES
- 📖** Implementation of machine learning algorithms with KERAS and TENSORFLOW

Research

- Scientific interests* **█** Galaxy formation and evolution • IR and (sub)mm astronomy • High-z galaxies
Strong gravitational lensing • Astrophysical applications of machine learning
- International collaborations* **█** Member of the **COSMOS** and **COSMOS-Web** collaborations
█ Member of the **Euclid Consortium** (Strong Lensing Science Working Group)
█ DPo Delegate for the **Vera Rubin Observatory** collaboration
- Contributed talks* **█** "Radio-Selected NIRdark galaxies: likely progenitors of high-z massive galaxies?" **EAS2023, Cracow (PL), July 2023)**
█ "Radio-Selected NIRdark galaxies: the ALMA view behind the dust" (**Observing the mm Universe, Grenoble (FR), June 2023)**
█ "An ALMA/JWST look into Radio-Selected NIRdark galaxies" **Annual meeting of the COSMOS collaboration, Rochester (US), May 2023)**
█ "Radio-Selected NIRdark galaxies: the ALMA view behind the dust" (**ALMA Meeting for Young Astronomers, Online, March 2023)**
█ "Bayesian Neural Networks and strong lensing: towards an uncertainties-aware machine learning algorithm for lens-modelling" (**EAS2022, Valencia (ES), June 2022)**
- Invited seminars* **█** "Radio-Selected NIRdark galaxies: likely progenitors of high-z massive galaxies?" (**INAF-OACN, April 2023)**
█ "Strong gravitational lensing: a machine learning perspective" (**INAF-OACN, April 2022)**
- Competitive telescope time* **█** **Co-I: "The obscured Universe at $z \sim 6$ on the way to JWST" (NOEMA, 27h)**
█ **Co-I: "The COSMOS High-z ALMA-MIRI Population Survey (CHAMPS): A Wide-Area Comprehensive Survey of the Dusty Universe" (ALMA, 143.5h)**
█ **Co-I: "Caught in the Web: ALMA Data for Every Sub-Millimeter Galaxy Over the COSMOS-Web Survey Field" (ALMA, 6.7h)**
- Competitive grants* **█** **Co-I: "Mass profiles of gravitational Lenses: MOdelling with Neural networks and scientific exploitation" (INAF Mini-Grant, 2022)**
- Visiting periods* **█** **Austin, TX, USA (Oct 2023 - Apr 2024):** Visiting the University of Texas at Austin to work with Dr. Caitlin Casey on the project "Unveiling the dark universe with JWST".
█ **Grenoble, FR (May 2023):** Visiting the IRAM headquarter in Grenoble to perform the data reduction of the NOEMA project "The obscured Universe at $z \sim 6$ on the way to JWST"
- Other relevant activities* **█** **Co-Supervisor** of Matteo Saponi's MSC thesis at University of Bologna
█ **Referee** for *Monthly Notices of the Royal Astronomical Society* (*Publons Profile*).
█ **Member of the LOC** for the conference "Views on the multi-phase interstellar medium in galaxies" (Bologna, September 2024)

Publications

Submitted

- **Gentile et al.**: "Dark progenitors and massive descendants: A first ALMA perspective on Radio-Selected NIRdark galaxies in the COSMOS field" (**Submitted to A&A**)

Accepted

- **Gentile et al. (2023)**: "Illuminating the Dark Side of Cosmic Star Formation III: Building the largest homogeneous sample of Radio-Selected Dusty Star-Forming Galaxies in COSMOS with PhoEBO" Accepted by *The Astrophysical Journal* [ADS Link](#)
- **Leuzzi et al. (2023)**: "Euclid Preparation: TBD Characterization of Convolutional Neural Networks for the identification of Galaxy-Galaxy Strong Lensing events" Accepted by *Astronomy & Astrophysics* [ADS Link](#)
- **Traina et al. (2023)**: "A₃COSMOS: the total infrared luminosity function and star formation rate density at $z=0.5-6$ " Accepted by *Astronomy & Astrophysics* [ADS Link](#)

2023

- **Gentile et al (2023)**: "LEMON: LENS MOdelling with Neural networks – I. Automated modelling of strong gravitational lenses with Bayesian Neural Networks" In *Monthly Notices of the Royal Astronomical Society*, Volume 522, Issue 4, July 2023, Pages 5442–5455 [ADS Link](#)
- **Behiri et al (2023)**: "Illuminating the Dark Side of Cosmic Star Formation II. A second date with RS-NIRdark galaxies in COSMOS" In *The Astrophysical Journal*, Volume 957, Issue 2, id.63, 14 pp. [ADS Link](#)
- **Busillo et al (2023)**: "CASCO: Cosmological and Astrophysical parameters from Cosmological simulations and Observations - I. Constraining physical processes in local star-forming galaxies" In *Monthly Notices of the Royal Astronomical Society*, Volume 525, Issue 4, pp.6191-6213 [ADS Link](#)
- **Casey et al (2023)**: "COSMOS-Web: An Overview of the JWST Cosmic Origins Survey" In *The Astrophysical Journal*, Volume 954, Issue 1, id.31, 32 pp. [ADS Link](#)
- **McKinney et al (2023)**: "A Near-Infrared Faint, Far-Infrared-Luminous Dusty galaxy at $z\sim 5$ in COSMOS-Web" In *The Astrophysical Journal*, Volume 956, Issue 2, id.72, 12 pp. [ADS Link](#)
- **Rojas et al (2023)**: "The impact of human expert visual inspection on the discovery of strong gravitational lenses" In *Monthly Notices of the Royal Astronomical Society*, Volume 523, Issue 3, pp.4413-4430 [ADS Link](#)

2022

- **Gentile et al (2022)**: Lenses In VoicE (LIVE): searching for strong gravitational lenses in the VOICE@VST survey using convolutional neural networks In *Monthly Notices of the Royal Astronomical Society*: Volume 510, Issue 1, pp.500-514. [ADS Link](#)

2021

- **Cantiello et al (2021)**: The Fornax Deep Survey with VST. IX. Catalog of sources in the FDS area with an example study for globular clusters and background galaxies. In *Astronomy & Astrophysics*: Volume 639, id.A136, 23 pp. [ADS Link](#)