



Dr. Raffaella Capasso

Researcher and Data Scientist

🕒 November 26th, 1990
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About me

I am passionate about data visualization and problem solving. Through big data processing, I am interested in extracting, understanding, and presenting the meaningful value hidden in data.

- LinkedIn
- Personal Website

Skills & Strengths

Programming

- Data Analysis & Visualization
- Machine learning
- Parallel computing

Python IDL C++
Fortran Julia

Team Development and Agile Project Management

- Daily stand-up meetings & Project updates
- Regular hack sessions

Keynote PowerPoint
Trello SLACK
Github Bitbucket

EXPERIENCE

- **Project leader** for both small (<5 people) and large (<20 people) teams as part of scientific collaborations, ensuring the completion of milestones and providing regular updates
- **Author and co-author** of 30 publications in peer-reviewed journals
- **Referee** for publications in leading physics journals (MNRAS, ApJ)
- **Speaker** at more than 20 national and international conferences, with full financial support

10.2021 - today **Scientific Researcher** | **Advisor: Prof. Daniel Grün**

Ludwig-Maximilians-Universität, Munich, Germany

As a member of the **astrophysics, cosmology, and artificial intelligence** group at the LMU, I apply precise and accurate machine learning techniques to advance the future of physics research. **Main duties and accomplishments:**

- Leader on a project based on a **VAE-GAN infrastructure**, aiming at creating a physical model of clusters of galaxies
- Organizer of the **“Generative Models Seminar”**
- Teaching assistant for python-based labs and astrophysical lectures

Statistics

- Monte Carlo methods and numerical statistics
- Bayesian statistical analysis

Operating systems

MacOS

Linux

Windows

Soft skills

- Team work
- Communication
- Problem solving (persistence, observation)
- Creativity (divergent thinking, inspiration, imagination)
- Time management (prioritizing, planning, organizing)

Languages

Italian

English

German




Swedish


Interests & Activities

Traveling | Photography | Reading | Music | Violin | Yoga | Good Food


10.2019 - 09.2021 Scientific Researcher |  Advisor: Prof. Jens Jasche
 University of Stockholm, Sweden


Application of advanced statistical methods, such as **machine learning**, to big astrophysical datasets to compare models with the observed Universe. **Main duties and accomplishments:**


- Improved the accuracy of standard contamination removal codes by 30% by means of **supervised machine learning techniques**
- Built a **Generative Adversarial Network** for fast generation of realistic galaxy images
-  Active member of the **Aquila Consortium**, focusing on using information theory and artificial intelligence to optimally extract physical information from data
- Organizer of the  “**Stockholm Data Science Forum**” and of the  “Cosmology and Gravity” seminar series
- **Supervisor** of more than 3 Master/PhD students, supporting them to achieve both goal and deadline driven results

06 - 09.2019 Postdoctoral researcher |  Advisor: Prof. Alexandro Saro
 INAF - Osservatorio Astronomico di Trieste, Italy

Main duties: Large scale data analysis and modelling, using more than one million simulated galaxies to assess the systematics associated to the measurement of dynamical cluster masses

05.2019 Research visit | 1 month, with Prof. Katherine Freese
 Leinweber Center for Theoretical Physics (LCTP, University of Michigan), Ann Arbor, USA

02.2019 Data Science ZEISS Hackathon
 ZEISS Digital Innovation Partners, Munich, Germany

12.2017 Observer for the Dark Energy Survey | ★ 5 nights
 Blanco Telescope (4m), Cerro Tololo Inter-American Observatory, Chile
Main duties: On-site monitoring of data taking for the Dark Energy Survey and optical imaging

SPECIALIZATION COURSES

02 - 04.2020 **Machine Learning course | by Andrew Ng**

📍 **Coursera**

A broad introduction to **machine learning and data mining**. Topics included: supervised and unsupervised learning, best practices in machine learning, and **numerous case studies and applications**, including text recognition, computer vision, medical informatics, audio and database mining.

EDUCATION

02.2015 - 04.2019 **PhD | 📄 magna cum laude, Advisor: Prof. Joseph Mohr**

📍 **Ludwig-Maximilians-Universität, Munich, Germany**

Thesis: "Galaxy Clusters: a Dynamical Perspective"

Main duties included:

- Exploitation of **analytical and numerical tools** to analyze the phase-space distribution of gravitationally interacting N-body systems
- Development of a **fully (MPI-) parallel Python code** based on the Jeans analysis, employing a self-consistent **Bayesian model averaging procedure**
- **Tutoring** of Bachelor/Master/PhD students
- 📄 **Organization** of the 1st Student Symposium "IMPRS talks to you" at the "International Max Planck Research Schools" on Astrophysics and of the "Clusters Journal Club"

10.2012 - 12.2014 **Master Degree in Astrophysics and Cosmology | Advisor: Prof. Lauro Moscardini**

📍 **University of Bologna "Alma Mater Studiorum", Bologna, Italy**

Thesis: "The gas mass fraction and the dynamical state of X-ray luminous clusters of galaxies at low redshift"

Main duties included being a tutor and a referee for Bachelor/Master students, liaison between students and professors, learning support when needed

09.2009 - 09.2012 **Bachelor Degree in Astronomy | Advisor: Prof. Daniele Dallacasa**

📍 **University of Bologna "Alma Mater Studiorum", Bologna, Italy**

Thesis: "Scattering processes in Astrophysics"

REFERENCES

Dr. Ben Hoyle | Carl ZEISS, Munich

Senior Data Scientist and Algorithms Engineer

(Contact details upon request)

Prof. Dr. Jens Jasche | Stockholms universitet

Professor and Data Scientist

(Contact details upon request)

**Prof. Dr. Alexandro Saro | INAF - Osservatorio Astronomico
di Trieste**

Professor and Data Scientist

(Contact details upon request)

Raffaella Capasso

München, March 18, 2022