# Antonio Ragagnin

Data di nascita: 04/11/1988 | **Nazionalità:** Italiana | (+39) 3713366550 | antonio.ragagnin@inaf.it

## ESPERIENZA LAVORATIVA

07/2007 – 12/2007 – Pordenone, Italia
**SYS ADMIN JUNIOR –** CIMOLAI SPA

Junior position in administration of the ICT network (Windows-server based).

01/2008 – 07/2008 – Conegliano, Italia
**SVILUPPATORE DI SITI WEB –** MANIFATTURA WEB

programming in PHP and help developing the content management system (CMS) used by the company to make web sites.

12/2013 – 08/2014 – Monfalcone, Italia
**SVILUPPATORE WEB –** ZCONSULTANCIES SRL

Developing a webapp on stock exchange with Java, Postgres SQL, and Spring framework

2018 – 31/03/2021 – Trieste, Italia
**RICERCATORE UNIVERSITARIO –** GIULIANO TAFFONI, INAF

Run and share results of zoom-in cosmological hydrodynamic simulations produced in Trieste, and study the dependency from cosmological parameters of galaxy cluster masses, concentration and satellite abundances in cosmological simualtions

01/04/2021 – ATTUALE – Bologna, Italia
**RICERCATORE UNIVERSITARIO –** LAURO MOSCARDINI, DIFA, UNIBO

I work in close collaboration with Lauro Moscardini, Massimo Meneghetti, Giulia Despali, and Carlo Giocoli to study how different small-scale physics modelling and dark matter paradigms affect strong lensing results.

## ALTRI TITOLI

**PI of CSCS Piz Daint 30 000 node hour GPU computing time**

**Co-I of various CINECA proposals**

**HPC-Europa3 2020 grants for a 1-month visit in Munich and 240k core-hours**

**Core-team member of Magneticum**

**PI of PLEIADI (INAF) 500000 corehour computing time**

2015
**Dopo tesi magistrale, menzione su Media INAF "il futuro delle galassie in scatola"**

## ISTRUZIONE E FORMAZIONE

2007 – 2011 – Italia
**LAUREA DI PRIMO LIVELLO IN FISICA (VOTO 110) –** Università degli studi di Trieste

2011 – 2014
**LAUREA MAGISTRALE IN FISICA TEORICA (110 E LODE) –** Università degli studi di Trieste

2014 – 2018
**DOTTORATO IN ASTORFISICA (CON LODE) –** Ludwig Maximilian University (LMU), Monaco di Baviera, Germania

2005 – 2007
**CISCO CCNA 1 –** CISCO

CCNA 1 is one Cisco's associate-level networking certification.

## COMPETENZE LINGUISTICHE

Lingua madre: **ITALIANO**

Altre lingue:

| | COMPRENSIONE | | ESPRESSIONE ORALE | | SCRITTURA |
|---|---|---|---|---|---|
| | Ascolto | Lettura | Produzione orale | Interazione orale | |
| **INGLESE** | C1 | C1 | C1 | C1 | C1 |

*Livelli: A1 e A2: Livello elementare B1 e B2: Livello intermedio C1 e C2: Livello avanzato*

## COMPETENZE DIGITALI

### Le mie competenze digitali

HPC | OpenACC | GPU | C | C++ | OpenMP | MPI | AnacondaPython

## TEACHING ASSISTING

### Attività Didattica Integrativa, Foundation of HPC , 2020/2021

### Lab assistant, Laboratorio di programmazione avanzata per la fisica, 2019/2020

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## RELAZIONE DESCRITTIVA DELLE ATTIVITÀ

### Galaxy Clusters

My main focus is the study of evolution of galaxy clusters in hydrodynamic numerical simulations and comparison with observations, in particular:

-- Within the Euclid collaboration I am writing a first-author paper on the comparison between observed and simulated data of galaxy clusters. We compare both X-ray and optical properties and focus on effects of projection and accretion histories in scaling relation scatters. See Ragagnin+22c, in prep.
-- Since optically selected samples of galaxy clusters may be biased towards being gas-poorer and having a lower X-ray surface brightness with respect to X-ray selected samples, I characterised these objectes in simulations in terms of their optical properties and accretion histories, see Ragagnin+22b, accepted.
-- Considered that galaxy cluster mass-calibration studies often relies on mass-richness relations (e.g. Costanzi+19), I studied the dependency of satellite abundance (see Ragagnin+21b, submitted), masses, concentrations, and NFW fit quality (see Ragagnin+21a), from some cosmological parameters (Omegam, Omegab, sigma8, h0) by combining results of various Magneticum run with different cosmologies.
-- I studied the impact of different AGN feedback models in galaxies in the core of simulated galaxy clusters, by comparing my results with observational studies as Bergmini+19, were data were taken from HFF and CLASH clusters, with the addition of VLT spectroscopy for some of them. See Ragagini+22a.
-- Thanks to the use of hydrodynamic simulations I analysed the high concentration of fossil groups, and found that their high magnitude gap (difference between BCG and most bright satellite magnitudes) is due to the BCG eating most of the satellites as the cluster relaxes and evolves without mergers. See Ragagnin+19.

### Software developement

During my PhD in Munich, besides my scientific research activities in Galaxy Clusters, I helped developing some parts of the N-body Gadget3 code, which were then used to run Magneticum cosmological hydrodynamic simulations.

In particular, at the time of my PhD studies, the code had a major bottleneck during the neighbour search, which I solved by exploiting the fact that particles were ordered within a space-filling curve (see Ragagnin+15).
Later I ported the major modules of the code to GPUs, since this is the kind of architectures were modern super computers are moving to (see Ragagnin+20).

Given the large amount of data produced by Magneticum simulations, I produced a web-portal (see Ragagnin+17) were users can select galaxy clusters by visually compunding complex queries or visually inspecting 2D maps (e.g. ICM map), and let users run jobs on said clusters, for instance the X-ray photon simulator PHOX as presented in Biffi+12.

## CONFERENZE E SEMINARI

**Invited speaker HydroSim Meetings 2014(Trieste), 2016(Trieste), 2018(Munich), 2019(Trieste), 2020 (Munich)**

**ADASS 2016, Trieste**

**Parallel Computing (ParCo) in Edimburg (2016), and Prague (2019) to present paper proceeding**

14/07/2022
**Invited Speaker to National Astronomy Meeting 2022 (NAM2022) in Warwick, UK**

To talk about my paper "Galaxies in the core of simulated galaxy clusters"

**Talk at Cosmology From Home 2022**

## SELEZIONE DI CINQUE PUBBLICAZIONI INERENTI AL BANDO

- **Ragagnin, A.,** et al. “Euclid: Covariance matrix between simulated galaxy clusters optical and X-ray observable properties”, in early stage prep. 2022.
- **Ragagnin, A.,** et al. “Low X-ray surface-brightness galaxy clusters, a simulation view”, accepted at A&A, 2022.
- **Ragagnin, A., et al. “Galaxies in the central regions of simulated galaxy clusters”, accepted at A&A, 2022.**
- **Ragagnin, A.,** Dolag, K., Moscardini, L., Biviano, A., and D'Onofrio, M., “Dependency of halo concentration on mass, redshift and fossilness in Magneticum hydrodynamic simulations”, MNRAS, vol. 486, no. 3, pp. 4001–4012, 2019. doi:10.1093/mnras/stz1103
- **Ragagnin, A.,** Saro, A., Singh, P., and Dolag, K., “Cosmology dependence of halo masses and concentrations in hydrodynamic simulations”, MNRAS, vol. 500, no. 4, pp. 5056–5071, 2021. doi: 10.1093/mnras/staa3523.

Autorizzo il trattamento dei miei dati personali presenti nel CV ai sensi dell’art. 13 d. lgs. 30 giugno 2003 n. 196 - “Codice in materia di protezione dei dati personali” e dell’art. 13 GDPR 679/16 - “Regolamento europeo sulla protezione dei dati personali”.

Le informazioni contenute nel presente "curriculum vitae et studiorum" sono rese sotto la personale responsabilità del sottoscritto, ai sensi degli articoli 46 e 47 del Decreto del Presidente della Repubblica 28 dicembre 2000, numero 445, e successive modifiche ed integrazioni, consapevole della responsabilità penale prevista dall'articolo 76 del medesimo Decreto per le ipotesi di falsità in atti e dichiarazioni mendaci.