Gaétan Facchinetti

Date of birth: February 20, 1994 — French
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Education

2018 - 2021 : Laboratoire Univers et Particules de Montpellier, *Montpellier*
Université de Montpellier, *Montpellier*
PhD in theoretical physics (dark matter, particle physics, astrophysics, cosmology)
Impact of dark matter structuring on small scales on its potential detection.
Defense: July 2021 (Jury: Prof. Ando, Prof. Serpico, Prof. Boehm, Prof. Cirelli, Prof. Peñarrubia Prof. Salati, Prof. Slatyer)

2017 - 2018 : Ecole Normale Supérieure, *Paris* & Ecole Normale Supérieure de Cachan, *Cachan*
Université Pierre et Marie Curie — Paris VI, *Paris*
Master's degree in theoretical physics: International Center for Fundamental Physics (15.3/20)
QFT, Standard model, QCD, Renormalisation, Group theory, General Relativity, Cosmology, ...

2015 - 2017 : Université Paris-Saclay & Ecole Normale Supérieure de Cachan, *Cachan*
Université Versailles Saint-Quentin-en-Yvelines, *Versailles*
Master's degree in mathematics: Analysis, Model and Simulation (17.3/20)

2014 - 2015 : Ecole Normale Supérieure de Cachan, *Cachan*
Université Pierre et Marie Curie — Paris VI, *Paris*
Bachelor's degree in physics: Theory, Experiment, Model (16.9/20)

2012 - 2014 : Lycée privé Sainte Geneviève, *Versailles*
Classe préparatoire: a two year intensive formation in mathematics and physics

Complementary Skills

Technical strengths:
Fortran 90, C/C++, Bash, Python, CUDA, OpenMPI, OpenMP, Mathematica, Matlab

French: native speaker
English: Good working level, TOEIC (965/990)
Spanish: Occasional practice

Work Experience (research)

April-June 2018: Internship at the Laboratoire Univers et Particules de Montpellier, Université de Montpellier, *Montpellier (France)*
Investigated the chemical and kinetic decoupling of dark matter and the formation of the first structures in the Universe

March-July 2017: Internship at the Laboratoire de Physique théorique de la Matière Condensée, Université Pierre et Marie Curie — Paris VI, *Paris (France)*
Numerically studied the « BMW » equations of the non perturbative renormalisation group

April-August 2016: Internship in the department of mathematical sciences, University of Southampton, *Southampton (England)*
Studied the collective behavior of atomic dipoles in a 2D lattice

May-June 2015: Internship at the Laboratoire de Physique Nucléaire et des Hautes Energies, Université Pierre et Marie Curie — Paris VI, *Paris (France)*
Simulated a small model of Time Projection Chamber for the DarkSide experiment

Work Experience (teaching)

2020-2021: Teaching assistant, Université de Montpellier, *Montpellier (France)*
Taught a class of 2nd year undergraduate students on optics/human vision (20 hrs)

2018-2019: Teaching assistant, Université de Montpellier, *Montpellier (France)*
Conducted tutorial sessions for 1st year undergraduate students (64 hours)

October-December 2015: Internship at Lycée Henri IV (high school), *Paris (France)*
Worked with a teacher (4 hours per week)

Refereed or Submitted Articles

3. *G. Facchinetti, J. Lavalle and M. Stref*: Statistics for dark matter subhalo searches in gamma rays from a kinematically constrained population model. I: Fermi-LAT-like telescopes. arXiv:2007.10392
   Submitted to Physical Review D.

2. *G. Facchinetti and J. Ruotekoski*, Phys. Rev. A. (97):023833, Feb. 2018
1. *G. Facchinetti, S.D. Jenkins and J. Ruotekoski*, Phys. Rev. Lett. 117(24):243601, Dec. 2016

Manuscripts in Preparation

6. *G. Facchinetti and J. Lavalle*: Statistics of subhalos in a simplified dark matter model
5. *G. Facchinetti, M. Stref and J. Lavalle*: Effect of stars on the Galactic dark matter subhalo population
4. *G. Facchinetti, J. Lavalle and M. Stref*: Statistics for dark matter subhalo searches in gamma rays from a kinematically constrained population model. II: CTA-like telescopes.

Main Seminars and Conference Presentations*

Seminars

LAPTh, Annecy, June 2020
Dark matter subhalo population in the Milky Way.
From particle models to gamma-rays point sources

IAP, Paris, October 2020 - ICAP meetings
Statistics of the subhalo population in the Milky Way for the detection of dark matter point sources

Conference talks

TeVPa, University of Sydney, December 2019.
Statistics of subhalos in the Milky Way for dark matter indirect searches with gamma rays

IRN Terascale, Université libre de Bruxelles, October 2019.
Statistics of the subhalo population in the Milky Way for the detection of dark matter point sources

Poster presentations

Dark Side of the Universe, Universidad de Buenos Aires, July 2019
& Invisibles Workshop, Universidad de Valencia, June 2019.
Subhalo properties in a simplified dark matter model

**Strongly impacted by Covid-19.*