CURRICULUM VITAE

Alessandro Lupi

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Research Interests:

- *Black Holes*
  - Massive black hole formation mechanisms
  - Black hole growth across cosmic times
  - Massive black hole binary formation and evolution
  - Tidal disruption events
- *Galaxies*
  - Galaxy formation and evolution
  - Cosmic dawn and reionization

Education:

Ph.D. in Astronomy and Astrophysics,
University of Insubria 2015
Thesis: *Black holes in galactic nuclei: seed formation from stellar mass black holes and massive black hole pairing in galaxy mergers*

MS (cum laude) in Astrophysics and Space Physics,
University of Milano Bicocca 2012
Thesis: *Black hole formation in the Universe at high redshift*

Bachelor (cum Laude) in Physics,
University of Milano Bicocca 2010
Thesis: *Techniques for dark matter detection through bubble formation*

Employments:

Institut d'Astrophysique de Paris 2015- now

Teaching:

Teaching assistant for the course of Electromagnetism II and Special Relativity at University of Insubria (Undergraduate level) 2013-2014

Teaching assistant for the course of Electromagnetism I at University of Insubria (Undergraduate level) 2014-2015

Supervision of undergraduate students:

Maria Cristina Fortuna, University of Milano Bicocca 2013
Matteo Zoccolan, University of Milano Bicocca 2015

Supervision of master students:

Hugo Pfister, Institut d'Astrophysique de Paris 2016

Professional activities:

Reviewer for the Monthly Notices of the Royal Astronomical Society (MNRAS)

Memberships:

Istituto Nazionale di Astrofisica (INAF, Italian Institute for Astrophysics) 2013-now

Computer skills:

N-body/Hydro codes:	Gadget2, Ramses, Enzo, GIZMO
Operating Systems:	Linux, Unix, Windows, Mac OSX
Programming:	Fortran77, Fortran90, C, C++, VB6, C#, Visual Basic.NET, Objective C, HTML, ASP, ASP.NET, PHP,Python
Specific software:	Tipsy, SPLASH, Pymses, yt, Matlab

ACADEMIC REFERENCES

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SCHOOLS, MEETINGS & CONFERENCES

PhD school Lucchin: Exoplanets and The dark side of the Universe
Location: Asiago (Italy), date: 24-28 June 2013 — Contributed talk

The Unquiet Universe
Location: Cefalù (Italy), date: 2-7 June 2014 — Contributed talk

AGN11 - Where Black Holes and Galaxies Meet
Location: Trieste (Italy), date: 23-26 September 2014 — Contributed talk

Guillermo Haro workshop 2015: Forming and fueling supermassive black hole seeds
Location: Tonantzintla, Puebla (Mexico), date: 6-24 July 2015 — Invited talk

Santa Cruz Galaxy workshop 2015
Location: Santa Cruz, California (USA), date: 17-21 August 2015 — Contributed talk

Dense stellar environments as a probe of astrophysics and general relativity: what we can learn from the first GW detection?
Location: Benasque (Spain), date: 5-18 June 2016 — Invited talk

Cosmic dawn of galaxy formation: linking theory and observations with new-generation spectral models
Location: Paris (France), date: 20-24 June 2016 — Poster

INVITED SEMINARS

Durham University, Durham (UK), March 2016

University of Maryland (USA), October 2016

GRANTS

- CO-I of the **PRIN-INAF** "Star formation and evolution in galactic nuclei" (PI M. Mapelli, INAF-OAPd),
  awarded **32k EUR for 2 years (2015-2016)** 2014

- Visiting fellowship funded by the Balzan foundation in the program "Centre for Cosmological Studies", to visit Johns Hopkins University,
  awarded **~3000 GPB for October 2016** 2016

ACCEPTED COMPUTATIONAL PROPOSALS

- **PI** of the proposal "Massive Black Hole Binary Formation in gas rich nuclei" at CINECA,
  50k CPU hours awarded for SPH/AMR simulations on the EURORA cluster 2013

- **PI** of the proposal "Massive Black Hole growth and feedback in galaxy mergers" at CINECA,
  150k CPU hours awarded for AMR simulations on the PLX2 cluster 2014

- **PI** of the proposal “Fast growth of stellar mass black holes via phases of super-critical accretion” at CINECA,
  200k CPU hours awarded for AMR simulations on the GALILEO cluster 2015

- CO-I of the proposal “The cosmic evolution of massive black holes” at GENCI,
  11.7M CPU hours awarded for numerical simulations on the OCCIGEN cluster 2017

PUBLICATION LIST

Accepted publications:

1. *Massive black hole and gas dynamics in galaxy nuclei mergers. I. Numerical implementation*, **A. Lupi**, F. Haardt and M. Dotti, 2015, MNRAS, 446, 1765-1774

2. *Constraining the high redshift formation of black hole seeds in nuclear star clusters with gas inflows,* **A. Lupi**, M. Colpi, B. Devecchi, G. Galanti and M. Volonteri, 2014, MNRAS, 442, 3616

3. *Massive black hole and gas dynamics in galaxy nuclei mergers. II. Black hole pairing and binary formation*, **A. Lupi**, F. Haardt, M. Dotti and M. Colpi

4. *Growing massive black holes through supercritical accretion of stellar-mass seeds,* **A. Lupi**, F. Haardt, M. Dotti, D. Fiacconi, L. Mayer and P. Madau

5. *Hydrodynamical simulations of the tidal stripping of binary stars by massive black holes, D. Mainetti,* **A. Lupi**, S. Campana and M. Colpi

6. Clumpy high-z galaxies as a testbed for feedback-regulated galaxy formation, L. Mayer, V. Tamburello, **A. Lupi**, B. Keller, J. Wadsley and P. Madau

7. Young and turbulent: the wild early life of today’s most massive galaxies, D. Fiacconi, L. Mayer, P. Madau, **A. Lupi**, M. Dotti and F. Haardt

8. The AGORA High-Resolution Galaxy Simulations Comparison Project. II: Isolated Disk Test, J. Kim, O. Agertz, R. Teyssier, M. J. Butler, D. Ceverino, J.H. Choi, R. Feldmann, B. W. Keller, **A. Lupi**, and the other AGORA collaboration members

Submitted publications:

- The fine line between total and partial tidal disruption events, D. Mainetti, **A. Lupi**, S. Campana and M. Colpi

Papers in preparations:

- A detailed chemistry network for galaxy simulations with meshless hydrodynamics, **A. Lupi**, S. Bovino, M. Volonteri, J. Silk and P. Hopkins

- Kinematic and dynamics of molecular gas in high redshift galaxies, **A. Lupi**, M. Volonteri and J. Silk

- The effect of Supernovae on to the ISM porosity: constraining the escape fraction in ‘normal’ and dwarf galaxies, **A. Lupi**, F. Haardt, M. Fumagalli and T. Theuns