

CURRICULUM VITAE

AUBERT

Dominique, Louis, Guy

DOB : 10/08/1978 38 years old

French

Lecturer (Maître de Conférences) at the University of Strasbourg since september 2006

Member of the Galaxy team of the Strasbourg Astronomical Observatory

Studies

- 2014 : Habilitation a diriger des Recherches, Université de Strasbourg, *Contributions to the numerical study of large scale structures formation and the reionization*
- 2001-2005 : PhD Paris-Orsay University, Strasbourg Astronomical Observatory/ Institut d'astrophysique de Paris. Adv : Christophe Pichon. Title : *Measures and dynamical implactions of dark matter flows through the virial sphere of galactic haloes*. Obtained with High honors.
- 2000 : Master « Astrophysics et associated techniques », Meudon Observatory
- 1998-2000 : Magistère de Physique Fondamentale, Université Paris XI Orsay

Past Career

- september 2005-september 2006 : Post-doc Horizon, Service d'astrophysique, CEA Saclay.
- april-august 2005: invited visitor at the Max Planck Institut for Astrophysics, Munich, Allemagne

Prizes and Honors

- Meso-Challenge Prize 2013, awarded by Equipex 'Equip@Meso' computing centers.
- HP-SF2A Prize « Young Scientist of the year » 2010 awarded by the French Astrophysical Society
- Finalist Bull-Fourier Prize 2010 for the development of numerical simulation

Comitees

- 2015- : Member of the GENCI « Technology Intelligence » Group
- 2012- : Member of the Scientific Council of the University of Strasbourg Computing Center
- 2012-2016 : Member of the 'Conseil National des Universités' (CNU), appointed substitute member, section 34
- 2014 : Member of the Working Group « Regional platforms » for the 2014 INSU/CNRS prospective
- 2011-2014 : Member of the "Astrophysics" expert group for the French spatial agency (CNES), a group in charge of evaluating mission proposals made to the agency and make recommendations.
- 2010 : designer of the ATON code, modeling the cosmological radiative transfer on GPUs, used for the technical evaluation of the proposals within the European PRACE project for the future petaflop machine.
- 2009 : Member of the Working Group "Computation, archiving, OV, software " for the 2009 prospective of the National Institute for Universe Sciences (INSU)
- 2008-2012 : member of the laboratory council of the Strasbourg Astronomical Observatory.

Science Working Groups

- 2015- : Member of the Square Kilometer Array (SKA) 'Epoch or Reionization' Science Working Group
- 2013-: Member of the CODA collaboration, P.I: Paul Shapiro, University of Texas, Austin, US
- 2015-: Member of ATHENA SWG, 'Formation and Growth of earliest supermassive black holes'

Referee

- Referee for Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, the Astrophysical Journal
- Referee for the Agence Nationale de la Recherche
- Referee for the Programme National Cosmologie/Galaxies (INSU/CNRS)

Current Teaching at the University of Strasbourg

- Cosmology, « Astrophysics » Master 2nd year, Astronomical Observatory
- Introduction to Cosmology, Licence, 1st year department
- Introductory Computer Science, Licence 2nd year, Earth & Space Sciences department

Pedagogical tasks

- 2009- : in charge of the « Computer Science through projects » teaching to 2nd year undergraduate students in the earth and space sciences department, University of Strasbourg
- 2009- 2012: in charge of the « Introductory Computer Science » teaching to 2nd year undergraduate students in the earth and space sciences department, University of Strasbourg
- 2009-2010 : in charge of the « Astrophysics» teaching to 3rd year undergraduate students in the earth and space sciences department , University of Strasbourg
- 2009: in charge of the « Parallel Computing» teaching to the doctoral students of the earth and space sciences department , University of Strasbourg

Jury Committees

- 2016- September : Thesis Opponent for Kay Yan Lee PhD defense « *Heating the Early Universe – Numerical Methods and Their Analysis* », Stockholm University, Sweden
- 2015 - December : Reviewer for Dr. Arnaud Siebert 'Habilitation a Diriger des Recherches' (HDR), University of Strasbourg « *Des Grands Relevés spectroscopiques aux propriétés de la Voie Lactée : le cas de RAVE* »
- 2014 - December : Examiner for M. Vincent Reverdy PhD, '*Propagation de la lumière dans un Univers structuré et nouvelles approches numériques en cosmologie*' (Adv J.M Alimi & Y. Rasera), Paris Observatory
- 2008 - August : Examiner for M. Nicolas Faber PhD '*Orbital Complexity in Hamiltonian dynamics*' (Adv. C. Boily & S. Portegies Zwart), University of Strasbourg.

Funded projects

- ANR EMMA 2012-2016: Principal Investigator. Dedicated to the development of a full cosmological simulation code for the Reionization (EMMA) with GPU acceleration. Funding granted 270 000 euros
- Epoch of Reionization Conference 2012 : 8000 euros support from National Cosmology/ Galaxy program (PNCG/INSU) and University of Strasbourg
- ANR LIDAU 2010-2012: Co-Investigator with B. Semelin (Observatoire de Paris). Project on the numerical simulation of the process of reionization on hybrid clusters of GPUs. Funding granted: 158 000 euros over 3 years for the Strasbourg node.
- 2008 PNCG-national program for cosmology and galaxy. Principal Investigator. Project on the numerical study of the stability of dark matter halos in their environment. Funding obtained: 5000 Euros for 1 +1 year.
- 2007 Project of the Scientific Council of the University Louis Pasteur. SINGS project, principal investigator. Project in collaboration with the CECPV for developing simulation tools for astrophysics on specific hardware (GPU cards GRAPES). Funding granted: 28 000 Euros for 2 years.

Organisation of Conferences

- Co-Chair of the « Astroparticle & Cosmology » colloquium, 2015 General Congress of the French Physics Society (SFP), Strasbourg
- Organizer (Chair) of the 'Epoch of Reionization 2012' international Conference, Strasbourg, April 2012
- Co-organizer with Romaric David (IT Department, University of Strasbourg) of the first GPU Day in Strasbourg (February 2010)
- Member of local organizing committee of the conference "Galactic & Stellar Dynamics", March 2008.

Students Supervision

- 2014-: Nicolas Deparis: PhD, University of Strasbourg, Co-advisor with P. Ocvirk, *Numerical Modelisation of the Local Group Reionization*
- 2013-2016 : Nicolas Gillet: PhD, University of Strasbourg, Co-advisor with P. Ocvirk, *Galaxy formation during and after the Reionization* (Now ERC Post-Doc at the Scuola Normale Superiore, Pisa, Italy)
- 2010 - 2013: Jonathan Chardin: Ph.D., University of Strasbourg. Co-advisor with Hervé Wozniak, Observatoire de Strasbourg *Multi-scale Reionization in cosmological simulations* (Now ERC Post-Doc at the Kavli Institute for Cosmology, Cambridge, UK)
- 2010: Matthew Kuhn: Master of "Applied Mathematics", Strasbourg, "Development of a hydrodynamic code for astrophysics on Multi-GPU architecture." Research Engineer at the IPHC, Strasbourg, since September 2010
- 2009: Nicolas Gaudin: Master of "Astrophysics", Strasbourg, "Dynamics of the central black hole of the Galaxy", co-supervised by C. Boily. Doctoral student at the Strasbourg Observatory since September 2009.
- 2008: Mehdi Amini: Master of "Computer Science" Strasbourg, "Development of a simulation code for galactic dynamics using GPUs" . Software engineer at Strasbourg University since December 2008.

- + 7 trainings at undergraduate level since 2007

Conferences, Schools, Seminars (selection)

- June 2016: 5th Max-Planck Summer Conference, Heidelberg, Germany, Invited
- June 2016 : Platform for Advanced Scientific Computing, Lausanne, Switzerland, Invited
- December 2015: Cosmology & First Light Conference, Paris, France, Invited
- September 2015: Computational Astrophysics Group Seminar, Service d'Astrophysique, CEA, Saclay, Invited
- May 2015: Institute Seminar, Institut d'Astrophysique de Paris, France, Invited
- April 2015: Olympian Symposium « Cosmology and Reionization », Thessaloniki, Greece
- April 2015: Lab Seminar, Institut d'Astrophysique Spatiale, Paris-Sud Orsay, France, Invited
- September 2014: Meso-Challenge Day, Institut Poincaré Paris, France
- March 2014: CNES Scientific Prospective Seminar, La Rochelle, France, Invited
- September 2013: Exascale Computing for Astrophysics, Ascona, Switzerland, Invited
- June 2013 : SKA-LOFAR Workshop, SF2A 2013, Montpellier France
- December 2012: Cosmological Radiative Transfer Comparison Project IV, University of Texas, Austin USA
- February 2012: Astro Sim Conference, Davos, Switzerland, Invited
- September 2011: Annual Meeting of the Astronomische Gesellschaft, Heidelberg, Germany
- July 2011: European Summer Campus, Strasbourg, LOC Member
- May 2011: CosmoFirst Conference, Marseille France
- September 2010: 2nd GPU Technology Conference, San Jose, USA
- June 2010: Journées SF2A 2010, HP-SF2A Prize ceremony and talk.
- June 2010: IAU Symposium 270 on Computational Star Formation, Barcelona, Spain
- May 2010: Advanced School on Computational Dynamics, Lorentz Center Leiden, invited
- April 2010: Workshop "Simulation of Liquid-Vapour Flows", Research Institute of Advanced Mathematics, Strasbourg France, invited
- February 2010: 1st GPU Day in Strasbourg, co-organizer.
- October 2009: 1st GPU Technology Conference, San Jose, USA
- September 2009: Parallel Computing Conference (PARCO), ENS Lyon, France, invited
- June 2009: Astrophysics Seminar, Institute of Theoretical Physics, Zurich, Switzerland, invited
- November 2008: Conference NOVICOSMO, Trieste, Italy
- June 2007: XXIII Conference of IAP, Paris, France
- December 2005: Symposium PNC, LAL, Orsay France.
- November 2005: Dark Matter Substructures Workshop, MIT, Cambridge USA, invited
- July 2005: XXI IAP Colloquium, Paris, France.

Outreach

- October 2015 : Science Fair, University of Strasbourg
- May 2014 : Conference the « Big Bang », Strasbourg Rotary Club
- September 2013: Public Conference on the 'Dark Energy', Jardin des Sciences, Strasbourg
- May 2012 : Public Conference, 'Wandering in the Universe', Soultz-sous-Forêt
- January 2012 : Public Conference on « Dark Matter », André Malraux Library, Strasbourg
- May 2011 : Public Conference on 'The Big Bang', Jardin des Sciences, Strasbourg
- October 2010: Science Coffee, Colmar
- December 2009: World Year of Astronomy, Public Discussion , Strasbourg Astronomical Observatory
- Novembre 2009 : Science Fair, Lycée des Pontonniers, Strasbourg
- April 2009 : Public Conference « The Dark Universe », Jardin des Sciences, Strasbourg
- March 2009 : Public Conference, Kleber Bookshop, Strasbourg

PUBLICATIONS EN LIEN DIRECT AVEC LE PROJET

Cosmic Dawn (CoDa): the First Radiation-Hydrodynamics Simulation of Reionization and Galaxy Formation in the Local Universe

Authors : Ocvirk, Pierre, Gillet, Nicolas, Shapiro, Paul R., **Aubert, Dominique**, Iliev, Ilian T., Teyssier, Romain, Yepes, Gustavo, Choi, Jun-Hwan, Sullivan, David, Knebe, Alexander, Gottloeber, Stefan, D'Aloisio, Anson, Park, Hyunbae, Hoffman, Yehuda, and Stranex, Timothy
Monthly Notices of the Royal Astronomical Society 2016 463

EMMA: an adaptive mesh refinement cosmological simulation code with radiative transfer

Authors : **Aubert, Dominique**, Deparis, Nicolas, and Ocvirk, Pierre
Monthly Notices of the Royal Astronomical Society 2015 454

Calibrating cosmological radiative transfer simulations with Ly α forest data: evidence for large spatial UV background fluctuations at $z \sim 5.6$ -5.8 due to rare bright sources

Authors : Chardin, Jonathan, Haehnelt, Martin G., **Aubert, Dominique**, and Puchwein, Ewald
Monthly Notices of the Royal Astronomical Society 2015 453

Local reionization histories with a merger tree of the HII regions

Authors : Chardin, Jonathan, **Aubert, Dominique**, and Ocvirk, Pierre
Astronomy and Astrophysics 2014 568

RAMSES-RT: radiation hydrodynamics in the cosmological context

Authors : Rosdahl, J., Blaizot, J., **Aubert, D.**, Stranex, T., and Teyssier, R.
Monthly Notices of the Royal Astronomical Society 2013 436

A study of simulated reionization histories with merger trees of HII regions

Authors : Chardin, J., **Aubert, D.**, and Ocvirk, P.
Astronomy and Astrophysics 2012 548

Reionization Simulations Powered by Graphics Processing Units. I. On the Structure of the Ultraviolet Radiation Field

Authors : **Aubert, Dominique** and Teyssier, Romain
The Astrophysical Journal 2010 724

The dusty, albeit ultraviolet bright, infancy of galaxies

Authors : Devriendt, J., Rimes, C., Pichon, C., Teyssier, R., Le Borgne, **D., Aubert, D.**, Audit, E., Colombi, S., Courty, S., Dubois, Y., Prunet, S., Rasera, Y., Slyz, A., and Tweed, D.
Monthly Notices of the Royal Astronomical Society 2010 403

A radiative transfer scheme for cosmological reionization based on a local Eddington tensor

Authors : **Aubert, Dominique** and Teyssier, Romain
Monthly Notices of the Royal Astronomical Society 2008 387

AUTRES PUBLICATIONS

Vast Planes of Satellites in a High-resolution Simulation of the Local Group: Comparison to Andromeda

Authors : Gillet, N., Ocvirk, P., **Aubert, D.**, Knebe, A., Libeskind, N., Yepes, G., Gottlober, S., and Hoffman, Y.
The Astrophysical Journal 2015 800

The Reionization of Galactic Satellite Populations

Authors : Ocvirk, P., Gillet, N., **Aubert, D.**, Knebe, A., Libeskind, N., Chardin, J., Gottlober, S., Yepes, G., and Hoffman, Y.
The Astrophysical Journal 2014 794

High-resolution Simulations of the Reionization of an Isolated Milky Way-M31 Galaxy Pair
Authors : Ocvirk, P., **Aubert, D.**, Chardin, J., Knebe, A., Libeskind, N.,
Gottlober, S., Yepes, G., and Hoffman, Y.
The Astrophysical Journal 2013 777

A signature of the internal reionization of the Milky Way?
Authors : Ocvirk, Pierre and **Aubert, Dominique**
Monthly Notices of the Royal Astronomical Society 2011 417

Galactic kinematics with modified Newtonian dynamics
Authors : Bienaymé, O., Famaey, B., Wu, X., Zhao, H.-S., and **Aubert, D.**
Astronomy and Astrophysics 2009 500

Full-sky weak-lensing simulation with 70 billion particles
Authors : Teyssier, R., Pires, S., Prunet, S., **Aubert, D.**, Pichon, C.,
Amara, A., Benabed, K., Colombi, S., Refregier, A., and Starck, J.-L.
Astronomy and Astrophysics 2009 497

A Particle-Mesh Integrator for Galactic Dynamics Powered by GPGPUs
Authors : **Aubert, Dominique**, Amini, Mehdi, and David, Romaric
Lecture Notes in Computer Science 2009 5544

Numerical investigation of lens models with substructures using the perturbative method
Authors : Peirani, S., Alard, C., Pichon, C., Gavazzi, R., and **Aubert, D.**
Monthly Notices of the Royal Astronomical Society 2008 390

Initial Conditions For Large Cosmological Simulations
Authors : Prunet, S., Pichon, C., **Aubert, D.**, Pogosyan, D., Teyssier, R.,
and Gottloeber, S.
The Astrophysical Journal Supplement Series 2008 178

Smooth Particle Lensing
Authors : **Aubert, Dominique**, Amara, Adam, and Metcalf, R.-Benton
Monthly Notices of the Royal Astronomical Society 2007 376

Dynamical flows through dark matter haloes - II. One- and two-point statistics at the virial radius
Authors : **Aubert, Dominique** and Pichon, Christophe
Monthly Notices of the Royal Astronomical Society 2007 374

Dynamical flows through dark matter haloes: inner perturbative dynamics, secular evolution and applications
Authors : Pichon, Christophe and **Aubert, Dominique**
Monthly Notices of the Royal Astronomical Society 2006 368

The origin and implications of dark matter anisotropic cosmic infall on L^* haloes
Authors : **Aubert, D.**, Pichon, C., and Colombi, S.
Monthly Notices of the Royal Astronomical Society 2004 352

The Clustering of Intergalactic Metals
Authors : Pichon, Christophe, Scannapieco, Evan, Aracil, Bastien,
Petitjean, Patrick, **Aubert, Dominique**, Bergeron, Jacqueline, and Colombi, Stephane
The Astrophysical Journal 2003 597