

Stéphane Blondin

Full-time researcher in astrophysics

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Research interests

- main thermonuclear (Type Ia) supernovae progenitor properties and explosion mechanisms, combining observations and numerical radiative-transfer simulations
- other supernovae and transients in general; cosmology with supernovae; spectral analysis algorithms

Education

- 2016 **Habilitation Thesis (Habilitation à Diriger des Recherches)**, Aix-Marseille Université, France
- 2002–2005 **PhD in Astronomy (Dr. rer. nat.)**, Ludwig-Maximilians Universität München (LMU), European Southern Observatory (ESO), International Max Planck Research School on Astrophysics (IMPRS), Germany (*magna cum laude*)
 - **Title:** *Optical Spectra of Thermonuclear Supernovae in the Local and Distant Universe*
 - **Supervisors:** *Dr. Bruno Leibundgut (ESO) and Prof. Adalbert Pauldrach (LMU)*
- 1998–2002 **Master of Physics**, University of Southampton, UK (*first class honours*)
- 1997 **French Scientific Baccalauréat with International Option**, Lycée International de Saint Germain en Laye, France (*Specialty in Mathematics, British section*)

Academic appointments

- 2018– **CNRS Researcher**, Laboratoire Franco-Chilien d'Astronomie, Santiago, Chili
- 2012–2018 **CNRS Researcher**, Laboratoire d'Astrophysique de Marseille, France
- 2010–2012 **CNRS Researcher**, Centre de Physique des Particules de Marseille, France
- 2008–2010 **Fellow**, European Southern Observatory, Garching bei München, Germany
- 2005–2008 **Postdoctoral Fellow**, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA

Research highlights

- I am the author of the **SuperNova IDentification (SNID) code** (Blondin & Tonry 2007), the most widely used tool for classifying new supernovae, with over 1500 citations
- I founded the **supernova data archive** of the Harvard-Smithsonian Center for Astrophysics (CfA SN Archive) in 2006 during my first postdoctoral appointment
- I have published and analyzed the **largest spectroscopic data set of Type Ia supernovae**, comprising 2603 spectra of 462 supernovae (Blondin et al. 2012)
- I am the author of **52 refereed publications** (12 as first author). Total citations: 6632
- **12 invited oral presentations** at conferences/workshops; **25 invited institute seminars**

Awards

- 2008 European Southern Observatory (ESO) Fellowship
- 2007 "Initiative Postdoc" Grant from the French Ministry of Research
- 2003 NATO Advanced Study Institute Grant
- 2002 International Max Planck Research School on Astrophysics (IMPRS) Studentship
- 2001, 2002 University of Southampton Physics and Astronomy Departmental Prize (×2)

Grants

- 2014–2017 PI of three grants from the “Programme National de Physique Stellaire” (10 500 EUR)
- 2011–2016 Co-I on an “Agence Nationale de la Recherche” (ANR) grant, *Radiative Transfer modelling of Core-Collapse Supernovae* (211 700 EUR)
- 2012–2013 Co-I on a Marie-Curie International Reintegration Grant (IRG), *Stellar explosions* (100 000 EUR)

Observing experience and Data reduction

- Programmes
 - PI on seven ESO-VLT programmes (regular and Target-of-Opportunity)
 - Responsible for the CfA SN spectroscopic follow-up programme (> 600 h during 2005-2008)
 - Co-I on ESO-VLT, HST, Gemini, Magellan, MMT, NOAO, FLWO proposals
- Observations
 - *Long-slit spectroscopy*: VLT+FORS, Gemini+GMOS, Magellan+LDSS, FLWO+FAST (optical)
 - *Multi-object spectroscopy*: VLT+FORS (optical)
 - *Echelle spectroscopy*: VLT+XSHOOTER (optical & NIR)
- Data
 - ample experience with spectroscopic data reduction and pipeline development (since 2002)
- Reduction
 - proficient with 2D deconvolution techniques for spectral extraction (Blondin et al. 2005)
 - software implementation of cross-correlation techniques for spectroscopic identification and redshift determination (SuperNova IDentification [SNID] code; Blondin & Tonry 2007)

Instrumentation and Space Missions

- Instrumentation
 - *Vera Rubin Observatory (formerly LSST)*: studies on real-time measurements of atmospheric transmission for auxiliary telescope requirements (Stubbs et al. 2007)
 - *XSHOOTER*: pre-commissioning verification of spectral formats and instrumental efficiencies (ESO Fellow duty 2008-2009)
 - *MISTRAL*: definition of resolution and wavelength range requirements for optical spectrograph science drivers on OHP's T193 telescope (2017-2018)
- Space Missions
 - *ATHENA*: member of the science working group “SWG 2.6: Luminous Extragalactic Transients” for ESA large mission X-ray satellite (since 2015)
 - *LISA*: associate member of the *Laser Interferometer Space Antenna* ESA mission (since 2018)
 - *γ-ray satellite*: defined science drivers for an MeV γ -ray satellite for NASA's 2020 Decadal Survey (Fryer et al. 2019)

Student supervision, Teaching and Outreach

- PhD
 - Randa Asad (University of Cincinnati), 2009-2012 (co-supervisor)
 - Malcolm Hicken (Harvard University), 2006-2008 (co-supervisor)
- Master
 - Jules Allegre (Ecole Normale Supérieure de Lyon), May-July 2019
 - Lucie Khlát (Ecole Normale Supérieure de Lyon), May-July 2018
 - Jordan Noël (Université de Montpellier), March-June 2017
 - Sarah Laghribi (Université de Montpellier), March-June 2013 (co-supervisor)
- Bachelor
 - Joshua Esteves (Aix-Marseille Université), November-December 2016
 - Vadim Becquet and Sébastien Aynaud (Aix-Marseille Université), June 2015
 - Bailes Brown (Harvard University), 2006 (co-supervisor)
- Teaching
 - The radiative display of Type Ia Supernovae*, Special Universe Lecture, Garching, July 2017
 - Job Possibilities in Astronomy*, The NEON Archive Observing School, ESO-Garching, July 2004
- Outreach
 - Regular organizer of public talks and astronomical activities for elementary schools
 - Astronomy consultant for French media (La Recherche, Ciel & Espace, Science & Vie, Le Monde)

Professional activities

- Group Leader Founder and leader of the *Transients discussion group* at LAM (2016-2017)
- Reviewer European Research Council (ERC); National Science Foundation (NSF); U.S.-Israel Binational Science Foundation (BSF); FONDECYT Initiation into Research; prix Jeunes Chercheurs de la Société Française de Physique; Veni grant of the Netherlands Organisation for Scientific Research; DiRAC HPC Resource Allocation Committee (×3); Opticon TAC (×2)
- Committees Master's thesis defense committee at the Pontificia Universidad Católica de Chile (2018)
Bachelor thesis defense committee at the Pontificia Universidad Católica de Chile (2018, 2019)
Postdoc selection committee for the Labex OCEVU (2016)
- Conference *Radiative transfer in supernovae*, MPI for Astrophysics (2019)
organization *Radiation Transfer and Explosive Thermonuclear Burning in Supernovae*, Weizmann Inst. (2018)
Supernovae in the Local Universe, Australia (2014)
- Societies IAU, SF2A (French Astronomical and Astrophysical Society)
- Referee Regular referee for peer-reviewed journals (A&A, ApJ, MNRAS, Nature)

Computer knowledge

- Programming Fortran 90/95, Python2/3, C/C++, IDL; parallelization with OpenMP/MPI; shell scripting
- Supercomputer Regular user of high-performance computing clusters (e.g. Harvard University Odyssey cluster)
- Other Web page design in HTML (+CSS); common word-processing software (MS Office, T_EX/L^AT_EX)

Languages

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|---------|----------------|--|
| French | Native speaker | <i>French citizen</i> |
| English | Bilingual | <i>Attended school in England (4 years); bilingual secondary education (7 years)</i> |
| Spanish | Excellent | <i>Studied throughout secondary (5 years); spoken at home</i> |
| German | Good | <i>Studied throughout secondary (7 years); lived 4^{1/2} years in Munich</i> |

References

Dr. Bruno Leibundgut

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Prof. Robert Kirshner

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Prof. Brian Schmidt

Australian National University
Nobel Prize in Physics 2011
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