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Coralie Neiner

- Personal** Born on July 31, 1975 in Strasbourg (France), married
- Experience and diploma** 2012, Pierre and Marie Curie University (France): **Habilitation à Diriger des Recherches** (HDR) : “Physical processes in B and Be stars: understanding the Be phenomenon”
- Since 2011, LESIA, Observatoire de Meudon (France): **Researcher** (CR1) at CNRS – Coordinator of the ‘MagMaS’ team
2006–2010, GEPI, Observatoire de Meudon (France): **Researcher** (CR2, then CR1) at CNRS – Coordinator of the ‘Hot stars’ team
- 2005, University of Leuven (Belgium): **Doctor Assistent** (postdoc) in the ‘Asteroseismology’ team
2003–2004, European Space Agency (ESA, Netherlands): **Research Fellow** (postdoc) in the ‘Asteroseismology for CoRoT and Eddington’ team
- 1998 – 2002, Universities of Strasbourg (France) and Amsterdam (Netherlands): **French and Dutch PhD** in astronomy with the **distinction 'Exceptional'**: “Pulsation, rotation, wind and magnetic field in early B-type stars”
1993–1998, University of Strasbourg (France): **Master** in astrophysics **with top honors**
- Distinctions** 2007: ‘**Young researcher’ award** of the French society for astronomy and astrophysics (SF2A)
- Expertise** My expertise covers all observational domains of massive stars physics, from their core to their environment:
- Seismology of massive stars: pulsations, rotation, mixing, internal structure
 - Magnetism: stellar magnetic fields, stellar wind and magnetospheres
 - Be phenomenon: ejections of matter, circumstellar disk and clouds, transport of angular momentum
 - Techniques : spectroscopy, spectropolarimetry, photometry, at all wavelengths (IR, optical, UV, and X), observations and modelling
- Publications** - Total number of publications: 202
- Refereed publications: 94
- Number of edited books: 9
- H factor: 21
- Current main activities** - PI of the proposal for a future satellite (UVMag) equipped with a UV and optical spectropolarimeter, PI of the UVMag science consortium, coordinator of the CNES R&T study for the spectropolarimeter of UVMag and coordinator of the CNES Phase 0 study for the UVMag mission

- CoI and GI of the CoRoT satellite, coordinator of the CoRoT Be star team, PI of the VLT/Flames program for the spectroscopic study of all CoRoT variables
- Member of the PLATO consortium
- Member of the KASC (Kepler AsteroSeismology Consortium)
- Co-PI of the MiMeS project, PI of the MiMeS large program on Narval at TBL, CoI of the MiMeS large program on ESPaDOnS at CFHT and CoI of the MiMeS large program on HARPSpol at ESO
- Co-PI of the BinaMIcS project, PI of the BinaMIcS large program on Narval at TBL and CoI of the BinaMIcS large program on ESPaDOnS at CFHT
- PI of the BRITE spectropolarimetric survey with Narval, ESPaDOnS and HarpsPol
- Coordinator of the BeSS database for Be stars and their spectra

Management

- Head of the ‘MagMaS’ team at LESIA (since 2011)
- Head of the ‘Hot stars’ team at GEPI (2006-2010)
- Counsellor of the EAS (since 2014)
- Member of the Scientific Council of the JMM Center for interferometry (since 2013)
- Coordinator of the federative action “Etoiles” of the Paris Observatory (since 2012)
- Member of the “Astronomy & Astrophysics” committee of the French space agency CNES (since 2010)
- Member (2006-2007) and President (2008-2010) of the French Time Allocation Committee (TAC) of CFHT
- Member of the international TAC of CFHT (2008-2012)
- Member of the Science Advisory Council (SAC) of CFHT (2008-2012)
- Member of the organizing committee of the IAU WG on ‘Active B stars’ (2007-2012)
- Member of the steering committee of MagICS, MiMeS, BinaMIcS and BRITE-France

Supervision

- Supervisor of the post-doctorate of J. Gutiérrez-Soto (2007-2008)
- Supervisor of the post-doctorate of F. Espinosa Lara (2008-2010)
- Supervisor of the post-doctorate of M. Briquet (2011)
- Supervisor of the post-doctorate of M. Oksala (2014-2016)
- Co-supervisor of the PhD thesis of A.-L. Huat (2006-2009)
- Co-supervisor of the PhD thesis of T. Semaan (2008-2010)
- Supervisor of the PhD thesis of A. Blazere (2013-2016)
- Supervisor of the PhD thesis of M. Pertenaïs (2013-2016)
- Supervisor of the PhD of B. Buysschaert (2014-2017)
- Supervisor or co-supervisor of 11 Master thesis (2001-2013)

Refereeing

- Expert for fellowships, research projects and grants at the Flamish FWO (since 2010)
- Expert for fellowships and research grants at the Czech GACR (since 2012)
- Expert for fellowships and research grants at the Walloon FNRS (since 2013)
- Referee for publications in A&A, ApJ, MNRAS, CoAst and IBVS

Fundings

- PI at LESIA of an ANR grant IMAGINE (2013-2017, 145000 euros)
- PI of a CNES/R&T grant for UVMag (2012-2015, 80000 euros)
- PI at GEPI of an ANR grant SIROCO (2008-2010, 113000 euros)
- PI of an INSU/PNPS funding (2006-2010, ~50000 euros)
- PI of a CNES/CoRoT grant for the CoRoT Be team (since 2006, ~73000 euros)
- PI of a Franco-Spanish EGIDE grant (2006-2008)
- PI of numerous fundings from the Scientific Council of the Paris Observatory, e.g. for Franco-Canadian and Franco-Brazilian collaborations
- PI of numerous fundings for the organization of the IAUS 272 symposium (Ile de France,

Ministère, INSU,..., ~130000 euros), schools (CNRS) or workshops (CIAS)

Organisation of events

- I organized the IAUS 272 symposium in Paris in 2010: “Active OB stars: structure, evolution, mass-loss and critical limits”, which gathered 180 participants. In this frame I was the chair of the SOC and member of the LOC, as well as the editor of the proceedings book.

- I regularly organize astronomical schools: in Oléron in 2003 and in La Rochelle in 2006 and 2009 on professional-amateur collaborations in spectroscopy, in Obernai in 2007 on the rotation of the Sun and the stars, in La Rochelle in 2007 on stellar magnetic fields, in Saint Flour in 2008 on the pulsations of the Sun and the stars, in Roscoff in 2011 on the environment of the Sun and the stars, in Besançon in 2014 on the cartography of the surface of the Sun and the stars.

- I also organized workshops: in Meudon in 2006 on spectropolarimetry, in Paris in 2009 and 2014 on the MiMeS project, and in Paris in 2014 on the UVMag mission.

- I am or have been part of the SOC of several events organized by others, e.g. the IAU symposium “New windows on massive stars: asteroseismology, interferometry and spectropolarimetry” in June 2014 in Geneva.

Outreach

- I participate in the organization of triennial schools on professional-amateur collaborations in spectroscopy.

- I edited and contributed to a book on spectroscopy for amateurs “Astronomical Spectrography for Amateurs” (2011).

- I initiated and developed the BeSS database for professional and amateur astronomers, which includes a full catalogue of Be stars and collects their spectra (~94000 spectra as of April 2014). This has drastically increased the number of amateur astronomers working in spectroscopy and in particular acquiring spectra of Be stars.

- We are currently developing a BeSS application for smartphones and tablets

- In the frame of the schools on professional-amateur collaborations and of the BeSS database, we have developed a small, cheap but efficient spectrograph (Lhires). The success of this spectrograph led 2 amateur astronomers to create a company “Shelyak Instruments” which now builds and sells an improved version of this spectrograph as well as many others they developed.

- I am registered on the list of female speakers of the “Women and Physics” Commission of the French Society of Physics (SFP), which promotes women in physics by proposing female speakers to various events.

- I am registered on the list of female speakers created by the French General Inspection for Social Affairs, which proposes female experts on scientific topics in the media (TV, radio, newspapers, internet...). In this context I participated to the TV show “C'est mon job” on the MCE channel, which presents one profession each week, in my case “astrophysicist”.

- In the same way I am registered on the list of female scientific experts of France Televisions.

- I also regularly participate to articles in popular journals, such as Ciel & Espace or L'astronomie (e.g. the special edition on stars for the summer 2014) and give public lectures.

Key results from my research activities in 2010-2014:

Seismology:

- Observational study of pulsations in Be stars with the CoRoT satellite
- Clear proof of the correlation between Be outbursts and pulsations
- Discovery of stochastically excited pulsation modes in Be stars
- Seismic modelling of very rapid rotators
- Seismic determination of the size and mass of the core of rapid rotators and interpretation in terms of physical processes
- Proposal of an explanation to the Be phenomenon with angular momentum transport by gravito-inertial waves

Magnetism:

- Statistical study of magnetism in massive stars thanks to the MiMeS project which includes 3 Large Programmes of observations
- Discovery and study of numerous magnetic massive stars
- Modelling of Zeeman signatures of fossil magnetic fields with oblique dipoles
- Observational proof of the inhibition of internal mixing by a magnetic field in massive stars
- First results on the magnetic fields in massive binaries thanks to BinaMIcS: they are less often magnetic than single stars probably due to formation processes.
- Study of the fossil field scenarios: no Vega-like fields are found in B stars as of today

Main starting or upcoming projects:

- UVMag (2012-2032): a satellite equipped with a UV and optical spectropolarimeter to study stars and their environment. There is an ongoing R&T study and CNES recommended the start of a Phase 0 study at the end of 2014. I am the PI of this space mission project.
- BinaMIcS (2013-2017): study of magnetic fields in binary stars and their interactions, thanks in particular to 2 Large Programmes of observations. I am the co-PI of the project and PI of the Narval LP.
- BRITE (launched in 2013 and 2014), Kepler2 (2014-2016) and PLATO (to be launched in 2024): multitechnics study of massive stars, combining seismology with spectropolarimetry.

List of my 39 papers among the 74 published in 2010-2014 for which I am the first, second or third author (for the remaining 35 papers I am fourth author or more):

- Alecian, E., Kochukhov, O., Neiner, C., Wade, G. A., et al., 2011, A&A 536 L6: "First HARPSpol discoveries of magnetic fields in massive stars"
- Alecian, E., Neiner, C., Mathis, S., Catala, C., et al., 2013, A&A 549 L8: "The dramatic change of the fossil magnetic field of HD 190073: evidence of the birth of the convective core in a Herbig star?"
- Briquet, M., Neiner, C., Aerts, C., Morel, T., et al., 2012, MNRAS 427 483: "Multisite spectroscopic seismic study of the beta Cep star V2052 Ophiuchi: inhibition of mixing by its magnetic field"
- Briquet, M., Neiner, C., Leroy, B. & Papics, P., 2013, A&A 557 L16: "Discovery of a magnetic field in the CoRoT hybrid B-type pulsator HD 43317"
- Goupil, M.J., Belkacem, K., Neiner, C., Lignières, F., & Green, J.J., 2013, LNP 865 "Studying Stellar Rotation and Convection"
- Gutiérrez-Soto, J., Neiner, C., Fabregat, J., Lanza, A.F., et al., 2011, IAU Symposium 272 451: "Short-term variations in Be stars observed by the CoRoT and Kepler space missions"
- Kochukhov, O., Lüftinger, T., Neiner, C., Alecian, E., and the MiMeS Collaboration, 2014, A&A 565A, 83: "Magnetic field topology of the unique chemically peculiar star CU Virginis"
- Lee, U., Neiner, C. & Mathis, S., 2014, MNRAS in press : "Angular momentum transport by stochastically excited oscillations in rapidly rotating massive stars"
- Lovekin, C., Neiner, C., Saio, H., Mathis, S., & Gutiérrez-Soto, J., 2010, Astronomische Nachrichten 331 1061: "Modelling results for two late Be stars observed by CoRoT"
- Mathis, S. & Neiner, C., 2014, SF2A-2013, 241: "Stochastic excitation of gravito-inertial waves in rotating stars"

- Mathis, S., Neiner, C., Alecian, E., Wade, G. and the BinaMIcS collaboration, 2014, IAU Symposium 302, in press: "Roadmap on the theoretical work of BinaMIcS"
- Mathis, S., Neiner, C. & Tran Minh, N., 2014, A&A 565A, 47: "Impact of rotation on stochastic excitation of gravity and gravito-inertial waves in stars"
- Neiner, C., 2012, SF2A-2012, 375: "UVMag: a UV+visible spectropolarimeter to study stellar magnetospheres"
- Neiner, C., 2011, EAS Publications Series 47 139: "Spectroscopy of Be stars"
- Neiner, C., 2010, Revista Mexicana de Astronomia y Astrofisica Conference Series 38 109: "Stellar surface phenomena: rotation, magnetism and pulsations"
- Neiner, C. & Alecian, E., 2014, EAS 64, 75: "The BinaMIcS project: binarity and magnetism"
- Neiner, C., Alecian, E., Briquet, M., Floquet, M., et al., 2012, A&A 537 A148: "Detecting and modelling the magnetic field of the beta Cephei star V2052 Ophiuchi"
- Neiner, C., Alecian, E., & Mathis, S., 2011, SF2A-2011, 509: "Progress on Magnetism in Massive Stars (MiMeS)"
- Neiner, C., de Batz, B., Cochard, F., Floquet, M., et al., 2011, AJ 142 149: "The Be Star Spectra (BeSS) Database"
- Neiner, C., Degroote, P., Coste, B., Briquet, M. & Mathis, S., 2014, IAU Symposium 302, in press: "Combining magnetic and seismic studies to constrain processes in massive stars"
- Neiner, C. & Floquet, M., 2011, SF2A-2011, 231: "Pulsation modes detected by CoRoT in the hot Be star HD 51452"
- Neiner, C., Floquet, M., Samadi, R., Espinosa Lara, F., et al., 2012, A&A 546 A47: "Stochastic gravito-inertial modes discovered by CoRoT in the hot Be star HD 51452"
- Neiner, C., Grunhut, J. H., Petit, V., ud-Doula, A., et al., 2012, MNRAS 426 2738: "An investigation of the magnetic properties of the classical Be star omega Ori by the MiMeS Collaboration"
- Neiner, C., Landstreet, J. D., Alecian, E., Owocki, S., et al., 2012, A&A 546 A44: "HD 96446: a puzzle for current models of magnetospheres?"
- Neiner, C. & Mathis, S., 2014, IAU Symposium 301: "Making a Be star: the role of rotation and pulsations"
- Neiner, C., Mathis, S., Saio H., Lee, U., 2014, ASPC 479, 319 : "Be outbursts : transport of angular momentum by waves"
- Neiner, C., Mathis, S., Saio, H., Lovekin, C., et al., 2012, A&A 539 A90: "Seismic modelling of the late Be stars HD 181231 and HD 175869 observed with CoRoT: a laboratory for mixing processes"
- Neiner, C., Monin, D., Leroy, B., Mathis, S., Bohlender, D., 2014, A&A 562 A59 : "gamma Pegasi: testing Vega-like magnetic fields in B stars"
- Neiner, C., Petit, P., Pares, L. and the UVMag consortium, 2014, IAU Symposium 302, in press: "UVMag: a UV and optical spectropolarimeter for stellar physics"
- Neiner, C., Tkachenko, A. & the MiMeS collaboration, 2014, A&A 563 L7: "Discovery of a magnetic field in the B pulsating system HD1976"
- Neiner, C., Wade, G., Meynet, G., & Peters, G., 2011, IAU Symposium 272: "Active OB Stars: Structure, Evolution, Mass Loss, and Critical Limits"
- Pertenais, M., Neiner, C., Pares, L., Petit, P. et al., 2014, SPIE: "UVMag: Space UV and visible spectropolarimetry"
- Rozelot, J.-P. & Neiner, C., 2011, EAS Publications Series 47: "Astronomical Spectrography for Amateurs"
- Rozelot, J.-P. & Neiner, C., 2011, EAS Publications Series 47 1: "Preface"
- Rozelot, J.-P. & Neiner, C., 2011, LNP 832 "The Pulsations of the Sun and the Stars"
- Rozelot, J.-P. & Neiner, C., 2013, LNP 857 "The Environments of the Sun and the Stars"
- Sarro, L. M., Debosscher, J., Neiner, C., Bello-García, A., et al., 2013, A&A 550 A120: "Improved variability classification of CoRoT targets with Giraffe spectra"
- Shultz, M., Wade, G. A., Neiner, C., Manset, N., et al., 2011, Magnetic Stars 224: "Searching for complex, weak or tangled magnetic fields in the blue supergiant Rigel"
- Shultz, Matthew, Wade, Gregg A., Neiner, Coralie, Manset, Nadine, et al., 2011, IAU Symposium 272 212: "Searching for weak or complex magnetic fields in polarized spectra of Rigel"