

Neige CALONNE

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Born 19/03/1988 at St Doulichard

French

WSL Institute for Snow and Avalanche Research SLF

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Actual position: **Post-doctoral researcher at the Institute for Snow and Avalanche Research WSL/SLF.**

EDUCATION

- 2011 – 2014 **PhD of the University of Grenoble**, Doctoral school IMEP², Grenoble, France.
- Title: « Physics of dry snow metamorphism: from microstructure to macroscopic properties »
 - Prepared at the CNRM – GAME, Snow Research Center CEN, (UMR 3589, Météo-France – CNRS) and the 3SR laboratory (UMR CNRS 5521, UJF – Grenoble INP)
 - PhD defended on November 14, 2014
 - Committee members: S. Drapier (Pres.), B. Goyeau (Rap.), M. Schneebeli (Rap.), I. Baker (Exam.), L. Salvo (Exam.), C. Geindreau (Dir.) et F. Flin (Co-Dir.)
- 2010 – 2011 **Master 2 Ocean, Atmosphere, Hydrology, Environmental Engineering**, University Joseph Fourier, Grenoble, France.
- 2009 – 2010 **Master 1 Geosphere**, major **Atmosphere**, University of La Réunion, St Denis de la Réunion, France.
- 2006 – 2009 **Bachelor Earth and Environmental**, University of Savoie, Chambéry, France.

RESEARCH ACTIVITIES

- From Dec. 2014 **Post-doc: Texture of snow and superficial firn in East Antarctica**
- Institute for Snow and Avalanche Research (WSL/SLF), Davos, Switzerland.
 - Team « Snow Physics » headed by M. Schneebeli.
- 2011 – 2014 **PhD thesis: Physics of dry snow metamorphism: from microstructure to macroscopic properties.**
- CNRM – GAME, Snow Research Center (CEN), Grenoble, France.
 - Directed by C. Geindreau (Professor at University Joseph Fourier) and F. Flin (Researcher at CNRM – GAME).
- June – Aug. 2012 **Laureate 2012 of the JSPS Summer Program, research stay: Experimental study of ice sublimation using the negative crystal method.**
- Institute of Low Temperature Science (ILTS), Sapporo, Japan.
 - Host researcher: Y. Furukawa (Director of ILTS until march, 2014).
- Feb. – June 2011 **Master thesis: Numerical and experimental investigations of the thermal conductivity of snow.**
- CNRM – GAME, Snow Research Center, Grenoble, France.
 - Directed by F. Flin (Researcher at CNRM – GAME) and S. Morin (IPEF).
- April – June 2010 **Research internship: Analysis of variability and trends of the total column ozone over South America.**
- Laboratory of Atmosphere and Cyclones, St Denis de la Réunion, France.
 - Directed by H. Bencherif (Professor at University of la Réunion).

TEACHING AND SUPERVISION

- June – July 2015 **Supervision of internship**
- Co-supervision of 50% of the internship of R. Caneill – L3 ENS Lyon – Water phase change in a cryogenic cell: calibration and application to snow study.
- Sept. – Oct. 2014 **Teaching at University Joseph Fourier**
- Bachelor of Engineering Science, Tutorial « Physics for civil engineering », 15 hours.
- April – Sept. 2013 **Supervision of internship**
- Co-supervision of 50% of the internship of A. Philip – Master 2 EAR – In vivo monitoring of a temperature gradient metamorphism by X-ray tomography using a cryogenic cell and quantitative characterization.

ACTIVITIES OF COLLECTIVE INTEREST

- 2013 **Involvement in the collective life of the laboratory**
- Vice-president of the personnel association of Météo-France.
- October 2013 **Participation in scientific events**
- La Fête de la Science, workshop « The color of snow », collab. LGGE (Grenoble)
- 2011 – 2014 **Management of the tomographic images at CEN**
- Project ANR DigitalSnow, collaboration LIRIS (Lyon) and LAMA (Chambéry)
 - Project VOR Tomo_FL, collaboration IRSTEA (Grenoble)
 - Internship of Antoine Wautier, collaboration 3SR (Grenoble)

SCIENTIFIC PRODUCTION

Peer-reviewed publications

- A1 **Calonne, N.**, F. Flin, B. Lesaffre, A. Dufour, J. Roulle, P. Puglièse, A. Philip, F. Lahoucine, C. Geindreau, J.-M. Panel, S. Rolland du Roscoat, and P. Charrier, [CellDyM: A room temperature operating cryogenic cell for the dynamic monitoring of snow metamorphism by time-lapse X-ray microtomography](#), *Geophys. Res. Lett.*, 42, doi:10.1002/2015GL063541, 2015. (IF=4,45)
- A2 **Calonne N.**, F. Flin, C. Geindreau, B. Lesaffre, and S. Rolland du Roscoat, [Study of a temperature gradient metamorphism of snow from 3-D images: time evolution of microstructures, physical properties and their associated anisotropy](#), *The Cryosphere*, 8, 2255–2274, doi:10.5194/tc-8-2255-20148, 2014 (IF=4,37)
- A3 **Calonne N.**, C. Geindreau, and F. Flin, [Macroscopic modeling for heat and water vapor transfer in dry snow by homogenization](#), *Journal of Physical Chemistry B*, 118(47), 13393-13403, 10.1021/jp5052535, 2014. (IF=3,37)
- A4 Hagenmuller P., **N. Calonne**, G. Chambon, F. Flin, C. Geindreau, and M. Naaim, [Characterization of the snow microstructural bonding system through the minimum cut density](#), *Cold Regions Science and Technology*, 108, 72-79, doi:10.1016/j.coldregions.2014.09.002, 2014. (IF=1,44)
- A5 **Calonne N.**, C. Geindreau, F. Flin, S. Morin, B. Lesaffre, S. Rolland du Roscoat, P. Charrier, [3D image-based numerical computations of snow permeability: links to specific surface area, density, and microstructural anisotropy](#), *The Cryosphere*, 6, 939–951, doi:10.5194/tc-6-939-2012, 2012. (IF=4,37)
- A6 **Calonne N.**, F. Flin, S. Morin, B. Lesaffre, S. Rolland du Roscoat, C. Geindreau, [Numerical and experimental investigations of the effective thermal conductivity of snow](#), *Geophysical Research Letter*, 38, L23501, doi:10.1029/2011GL049234, 2011. (IF=4,45)

Submitted manuscripts

- A7 **Calonne N.**, C. Geindreau, and F. Flin, Influence of the convection on the macroscopic modeling of heat and water vapor transfer in dry snow, *Journal of Geophysical Research*, under review.

Other publications

- B1 Hagenmuller P., G. Chambon, B. Lesaffre, F. Flin, **N. Calonne**, and M. Naaim, [Energy-based binary segmentation of snow microtomographic images](#), *Proceedings of the 1st International Conference on Tomography of Materials and Structures (ICTMS)*, July 2013, Ghent, Belgium, 4 p., 2013.

International conferences and workshops

- C1 **Calonne N.**, C. Geindreau, and F. Flin, Macroscopic modeling for heat and water vapor transfer with phase change in dry snow by homogenization, *IUGG 2015 Conference*, IACS Symposium, Prague, Czech Republic, 22 June – 2 July 2015, accepted poster.
- C2 **Calonne N.**, F. Flin, B. Lesaffre, S. Rolland du Roscoat, and C. Geindreau, Study of a temperature gradient metamorphism of snow from 3-D images: time evolution of microstructures, physical properties and their associated anisotropy, *Seminar at the Institute for snow and avalanche research*, Davos, Switzerland, 25 April 2014, talk.
- C3 **Calonne N.**, C. Geindreau, F. Flin, B. Lesaffre and S. Rolland du Roscoat, Towards the macroscopic modeling of dry snow metamorphism using an upscaling method, *13th International Conference on the Physics and Chemistry of Ice*, Hanover, USA, 17 - 20 March 2014, talk.
- C4 **Calonne N.**, C. Geindreau, F. Flin, B. Lesaffre and S. Rolland du Roscoat, About the relationship between microstructural and effective physical properties of snow computed on 3D images: comparison with measurements and models, *AGU 2013*, San Francisco, USA, 9 - 13 December 2013, *invited poster*.
- C5 **Calonne N.**, F. Flin, B. Lesaffre, A. Dufour, J. Roulle, P. Puglièse, A. Philip, F. Lahoucine, S. Rolland du Roscoat and C. Geindreau, A room temperature operating cryogenic cell for in vivo monitoring of dry snow metamorphism by X-ray microtomography, *AGU 2013*, San Francisco, USA, 9 - 13 December 2013, poster.
- C6 **Calonne N.**, F. Flin, C. Geindreau, B. Lesaffre and S. Rolland du Roscoat, Study of a temperature gradient metamorphism of snow from 3D images: time evolution of microstructures, physical properties and their associated anisotropy, *International Snow Science Workshop 2013*, Grenoble - Chamonix Mt Blanc, France, 7 - 11 October 2013, poster.
- C7 **Calonne N.**, Y. Furukawa, C. Geindreau, and F. Flin, Study of the ice crystal growth and decay in air, *JSPS Summer Program 2012 - Poster Session*, Sokendai, Japan, 14 June 2012, poster.
- C8 **Calonne N.**, F. Flin, S. Morin, B. Lesaffre, S. Rolland du Roscoat, C. Geindreau, 3D image-based numerical simulations and experimental measurements of the effective thermal conductivity of snow, *Micro-DICE Conference 2011*, Grenoble, France, 7 - 9 November 2011, talk.
- C9 **Calonne N.**, F. Flin, S. Morin, C. Geindreau, S. Rolland du Roscoat, B. Lesaffre, C. Carmagnola, F. Domine, On the relationships between key physical properties of snow at the microstructure scale, *IUGG 2011 Conference*, IACS Symposium, Melbourne, Australia, 28 June - 7 July 2011, poster.

National conferences

- D1 **Calonne N.**, F. Flin, B. Lesaffre, S. Rolland du Roscoat, and C. Geindreau, Métamorphose de la neige sèche : de la microstructure aux propriétés macroscopiques, *Rencontre DySCo 2014* (Dynamique des Systèmes Complexes), Les 2 Alpes, 27 – 28 March 2014, talk.

Monographs

- E1 **Calonne N.**, Physique des métamorphoses de la neige sèche : de la microstructure aux propriétés macroscopiques, *PhD thesis of University of Grenoble*, September, 2014.
- E2 **Calonne N.**, Approche microscopique et macroscopique de la conductivité thermique de la neige, *Master thesis of University Joseph Fourier*, June, 2011.
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