

Franck Garestier

Maître de Conférences

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RESEARCH INTERESTS

Permafrost environment survey using SAR Differential Polarimetric Interferometry
geomorphological processes and soil parameter estimation over various Siberian sites (TerraSAR-X, Sentinel)

Multi-scale remote sensing of the coasts using SfM, LiDAR and SAR
change detection for littoral imaging under climatic influence over the coasts of Manche

Forest biomass estimation using SAR Polarimetric Interferometry
forest modelling / height inversion at high and low frequencies (BIOMASS)

TEACHING ACTIVITIES AT UNIVERSITY OF CAEN

~ 200 h/y courses at BSc. and MSc. levels

Remote sensing of coastal areas (M2 Geosciences)

Remote sensing, signal processing & geophysics (M1 Geosciences & Physics)

Field trip in French Alps (L3 Geosciences)

Planetology (L2 Geosciences)

Mathematics & radiative transfer theory (L1 Geosciences)

SUPERVISION & ADMINISTRATION

PhD of Thomas Chevalier : non-linear movement estimation using D-Pol-InSAR, 2017-2020

PhD of Samira Hosseini : Forest biomass estimation using Pol-InSAR (Univ. Tehran), 2017-2018

PhD of Émilie Poullain : LiDAR intensity exploitation for coastal survey, 2010-2013

PhD of Alberto García-Martín : Forest biomass estimation using spaceborne techniques (Univ. Zaragoza), summer 2006

Several master thesis about remote sensing of earth surface

Coordinator of L1-L2 (BSc. 1-2) Earth Science component of general Physics-Chemistry BSc. of Univ. Caen, 2010-2012

Coordinator of the L2 (BSc. 2) Earth Science full diploma of Univ. Caen, 2012-2014

EDUCATION

Post-doc CNES on ESA Earth Explorer mission BIOMASS, CESBIO, Toulouse, 2006-2008

Visiting scientist at DLR, Oberpfaffenhofen, summer 2004.

PhD of SAR Remote Sensing (Pol-InSAR), ONERA-Obs. Bordeaux, 2003-2006

BSc & MSc of Geology, Universities of Poitiers and Toulouse

REVIEWS

Journals & conf. : IEEE GRSL, IEEE TGRS, IEEE JSTAR, Remote Sensing of Environment, Télédétection, IGARSS

Projects : ESA-ESTEC CONTRACTS, INSU-PNTS, INSU-EC2CO, ANR

FUNDINGS

NASA-CNES SWOT satellite for monitoring of coasts and estuaries, coord. : B. Laignel, *CNES-TOSCA*, 2017-

PERMAfrost survey using remote SENSING, *CNES-TOSCA*, F. Garestier & A. Kouraev, 2017-

Siberian periglacial environment observation and modelling, *ANR "CLASSIQUE"*, coord. : M. Sourdeval, 2010-2016.

InSAR for permafrost physical parameter assessment, *INSU-PNTS*, F. Garestier & A. Kouraev, 2009-2011.

SAR-LiDAR remote sensing for coastal survey, *INSU-PNTS*, coord. : F. Garestier, 2010-2012.

CLAREC-CIRCLE LiDAR for coastal survey, *Univ. Normandy-CNRS*, coord. : F. Levoy, 2009-

BIOMASS Earth Explorer mission, *ESA-ESTEC*, coord. : T. Le Toan & S. Quegan, 2006-

P-band SAR wave interaction and information retrieval, *ESA-ESTEC*, T. Le Toan & F. Garestier, 2006.

Assessing SAR calibration requirements using geophysical retrieval algorithms, *ESA-ESTEC*, T. Le Toan & F. Garestier, 2006.

EGYPTSAR04 : Pol-InSAR Analysis, P. Dubois-Fernandez & F. Garestier, *ESA-ESTEC*, 2005.

PolInSAR technique, P. Dubois-Fernandez & F. Garestier, *CNES R&T*, 2004.

BOOK CHAPTER

Franck Levoy, **Franck Garestier**, Laurent Froideval, Olivier Monfort and Emilie Poullain, "Land Surface Remote Sensing in Urban and Coastal Areas"-Chapter 6 : "Contributions of Airborne Topographic LiDAR to the Study of Coastal Systems Remote Sensing Observations of Continental Surfaces", *Elsevier*, Sept 2016.

JOURNALS

E. A. Zakharova, A. V. Kouraev, S. Guillaso, **F. Garestier**, R. V. Desyatkin, A. R. Desyatkin, "Recent dynamic of hydro-ecosystems of thermokarst depressions in the Central Siberia from satellite and in situ observations : importance for agriculture and human life". *Science of the Total Environment*, 2017 (accepted for publication)

E. Poullain, **F. Garestier**, F. Levoy & P. Bretel, "Analysis of ALS Intensity Behavior as a Function of the Incidence Angle in Coastal Environments", Vol. 9, No. 1, *IEEE JSTAR*, pp. 313-325, 2016.

F. Garestier, P. Bretel, O. Monfort, F. Levoy & E. Poullain, "Anisotropic Surface Detection Over Coastal Environment Using Near-IR LiDAR Intensity Maps," *IEEE JSTAR*, Vol. 8, No. 2, pp. 727-739, 2015.

K. Padoja ... **F. Garestier**," Coastal staircase sequences reflecting sea-level oscillations and tectonic uplift during the Quaternary and Neogene," *Earth Science Review*, Vol. 132, pp. 13-38, 2014.

F. Garestier, P. Dubois-Fernandez, I. Champion and T. Le Toan, "Pine Forest Investigation Using High Resolution P-band PolInSAR Data," *Remote Sensing of Environment*, Vol. 115, No. 11, pp. 2897-2905, 2011.

F. Garestier and T. Le Toan, "Estimation Of The Backscatter Vertical Profile Of A Pine Forest Using Single Baseline P-band (Pol-)InSAR Data," *IEEE TGRS*, Vol. 48, No. 9, pp. 3340-3348, September 2010.

F. Garestier and T. Le Toan, "Forest Modeling For Height Inversion Using Single Baseline (Pol-)InSAR Data," *IEEE TGRS*, Vol. 48, No. 3, pp. 1528-1539, February 2010.

F. Garestier, P. Dubois-Fernandez, D. Guyon and T. Le Toan "Forest Biophysical Parameter Estimation Using L- And P-Band Polarimetric SAR Data," *IEEE TGRS*, Vol. 47, No. 10, pp. 3379-3388, October 2009.

F. Garestier, P. Dubois-Fernandez, I. Champion, "Forest Height Inversion Using High Resolution P-band PolInSAR Data," *IEEE Transactions on Geosciences and Remote Sensing*, Vol. 46, No. 10, pp. 3544-3559, November 2008.

P. Dubois-Fernandez, J.-C. Souyris, S. Angelliaume and **F. Garestier** , "The Compact Polarimetry Alternative for Spaceborne SAR at Low Frequency," *IEEE Transactions on Geosciences and Remote Sensing*, Vol. 46, No. 10, pp. 3208-3222, November 2008.

F. Garestier, P. Dubois-Fernandez, K. P. Papathanassiou, "Pine Forest Height Inversion Using Single-Pass X-band PolInSAR Data," *IEEE Transactions on Geosciences and Remote Sensing*, Vol. 44, No. 2, pp. 356-364, December 2007.

N. Baghdadi, N. Holah, P. Dubois-Fernandez, X. Dupuis and **F. Garestier**, "Evaluation of polarimetric L- and P-bands RAMSES data for characterizing Mediterranean vineyards," *Canadian Journal of Remote Sensing*, Vol. 32, No. 6, pp. 380-389, 2007.

F. Garestier, P. Dubois-Fernandez, X. Dupuis, P. Paillou and I. Hajnsek, "PolInSAR Analysis of X-Band Data over Vegetated and Urban Areas," *IEEE Transactions on Geosciences and Remote Sensing*, Vol. 44, No. 2, pp. 356-364, February 2006.

P. Dubois-Fernandez, X. Dupuis and **F. Garestier**, "PolInSAR Calibration of Deramp-on-receive System : Example with the RAMSES Airborne System," *Canadian Journal of Remote Sensing*, Vol. 31, No. 1, pp. 112-121, 2005.

CONFERENCES

F. Garestier, S. Guillaso, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, " Following deformation over permafrost environment during a whole freeze/thaw cycle using Pol-D-InSAR".*The 2nd Asian Conference on Permafrost (ACOP2017)*, 2-6 July 2017, Sapporo, Japan.

F. Garestier, S. Guillaso, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, " Following deformation over permafrost environment during a whole freeze/thaw cycle using Pol-D-InSAR. *V International field symposium "West Siberian Peatlands and Carbon Cycle : Past and Present" and International conference "Carbon Balance of Western Siberian Mires in the Context of Climate Change" (WSPCC 17)*, 19-29 June, 2017, Khanty-Mansiysk, Russia.

E. A. Zakharova, A. V. Kouraev, S. Guillaso, **F. Garestier**, R. V. Desyatkin, A. R. Desyatkin, "Recent dynamic of hydro-ecosystems of thermokarst depressions in the Central Siberia from satellite and in situ observations : importance for agriculture and human life." *The 2nd Asian Conference on Permafrost (ACOP2017)*, 2-6 July 2017, Sapporo, Japan.

E. A. Zakharova, A. V. Kouraev, S. Guillaso, **F. Garestier**, R. V. Desyatkin, A. R. Desyatkin, "Remote sensing of Siberian wetlands and peatlands." *V International field symposium "West Siberian Peatlands and Carbon Cycle : Past and Present" and International conference "Carbon Balance of Western Siberian Mires in the Context of Climate Change" (WSPCC 17)*, 19-29 June, 2017, Khanty-Mansiysk, Russia.

F. Garestier , S. Guillaso, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, Surveillance du permafrost par interférométrie différentielle *RST 2016*, Caen, 24-28 october 2016.

F. Garestier , S. Guillaso, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, Investigation of the permafrost environment using Pol D-InSAR at X-band *1st LYON Workshop, Krasnoyarsk-Igarka*, 17-24 july, 2015.

S. Guillaso, **F. Garestier**, Déformation estimation on low coherence areas by means of Polarimetric Differential SAR Interferometry *8th International Workshop on the Analysis of Multitemporal Remote Sensing Images (Multi-Temp)*, Annecy, 22-24 July, 2015.

F. Garestier, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, S. Guillaso, Permafrost investigation in Central Siberia (Yakutia) using X-Band Dual-Pol InSAR data, *IGARSS and 35th Canadian Symposium on Remote Sensing*, 13-18 July 2014, Quebec City, Quebec, Canada.

F. Garestier, E. A. Zakharova, A. V. Kouraev, R. V. Desyatkin, S. Guillaso, Ground movement estimation in Yakutia using Dual-Pol InSAR TerraSAR-X data, *WSPCC 2014-Fourth International Field Symposium West Siberian Peatlands And Carbon Cycle : Past And Present*, August 4-17, 2014, Novosibirsk, Russia.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**., F. Rémy, S. N. Kirpotin, S. N. Vorobyev, A. Ye. Berezin, Monitoring hydrology of Siberian wetlands from satellite and in-situ observations, *Proceedings of the 4th DUE Permafrost User Workshop*, ESA ESRIN, Frascati, Italy the 11-13 February 2014.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**., F. Rémy, S. N. Kirpotin, S. N. Vorobyev, A. Ye. Berezin, Hydrology of permafrost-affected Siberian wetlands from satellite and in-situ observations, *THAW 2014 - THERMOKARST Aquatic ecosystems Workshop : Freshwater ecosystems in changing permafrost landscapes*, 12-15 March 2014 - Quebec City, Quebec, Canada.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**., F. Rémy, S. N. Kirpotin, S. N. Vorobyev, A. Ye. Berezin, Satellite and in situ observations for studies of hydrological regime of permafrost-affected Siberian wetlands, *EUCOP4 - 4th European Conference on Permafrost*, 18-21 June 2014, Evora, Portugal.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**., F. Rémy, S. N. Kirpotin, S. N. Vorobyev, A. Ye. Berezin, Hydrological regime of Siberian wetlands from satellite and in-situ observations, *WSPCC 2014 - Fourth International Field Symposium WEST SIBERIAN PEATLANDS AND CARBON CYCLE : PAST AND PRESENT*, 4-17 August 2014, Novosibirsk, Russia.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**., F. Rémy, S. N. Kirpotin, S. N. Vorobyev, A. Ye. Berezin, Satellite and in situ observations for studies of hydrological regime of permafrost-affected Siberian wetlands, *4th European Conference on Permafrost*, EVORA, 2014.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**, F. Rémy, V. A. Zemtsov, A. Ye. Berezin, V. A. Bazanov, S. N. Kirpotin, Study of wetlands of the Boreal zone using satellite monitoring and in situ observations, *Proceedings of the 7th All-Russian hydrological congress*, 19-21 November 2013, St Petersburg, Russia.

E.A. Zakharova, A. V. Kouraev, **F. Garestier**, Cretaux J-F., Berge-Nguyen M. Multi-satellite approach and in-situ observations to study hydrology of boreal wetlands. *Proceedings of the ESA Living Planet Symposium*, Edinbourg, Scotland, 9-13 September 2013, ESA Publications SP-722, Digital media.

E. Poullain, **F. Garestier**, P. Bretel, F. Levoy, "Modeling of ALS intensity behavior as a function of incidence angle for coastal zone surface study," *In Proc. of IGARSS 12*, Munich, Germany, 2012.

F. Garestier, P. Bretel, O. Monfort and F. Levoy, "Anisotropic surface detection using near-IR LiDAR intensity maps over coastal environment," *Proc. of IGARSS 11*, Vancouver, Canada, 2011.

P. Bretel, O. Monfort, **F. Garestier** and F. Levoy, "Using ALS measurements for automatic coastline extraction," *Proc. of European LiDAR 11*, Salzburg, Austria, 2011.

F. Garestier and T. Le Toan, "Evaluation of forest modelling for height estimation using P-band Pol-InSAR data," *Proc. of BIOGEOSAR 07*, Bari, Italy, 2007.

F. Garestier and T. Le Toan, "Vegetation modelling for height inversion using InSAR/Pol-InSAR data," *Proc. of IGARSS 07*, Barcelona, Spain, 2007.

F. Garestier, T. Le Toan and P. Dubois-Fernandez, "Forest height estimation using P-band Pol-InSAR data," *Proc. of POLInSAR 07*, Frascati, Italy, 2007.

P. Dubois-Fernandez, **F. Garestier**, I. Champion J.-C. Souyris, "The specificity of P band PolInSAR data over vegetation," *Proc. of POLInSAR 07*, Frascati, Italy, 2007.

P. Dubois-Fernandez, **F. Garestier**, I. Champion, "Forest parameter retrieval from PolInSAR data at P band," *Proc. of CEOS 06*, Edinburgh, UK, 2006.

P. Dubois-Fernandez, **F. Garestier**, X. Dupuis, J. Champion, "Ramses P Band Campaign over the Nezer Forest : Calibration and Polarimetric Analysis," *Proc. of EUSAR 06*, Dresden, Germany, 2006.

F. Garestier, P. Dubois-Fernandez, X. Dupuis et P. Paillou, "PolInSAR Analysis of Pine Forest at L and P Band on High Resolution Data," *Proc. of IGARSS 05*, Seoul, Korea, 2005.

F. Garestier, P. Dubois-Fernandez, X. Dupuis et P. Paillou, "Resolution Effects on Polar and PolInSAR High Resolution X Band Data," *Proc. of IGARSS 05*, Seoul, Korea, 2005.

F. Garestier, P. Dubois-Fernandez, K. Papathannassiou et I. Hajnsek, "Analysis of Forest Parameters and Agricultural Field Structure from High Resolution PolInSAR X Band Data," *Proc. of POLInSAR 05*, Frascati, Italy, 2005.

F. Garestier, P. Dubois-Fernandez, X. Dupuis and P. Paillou, "Resolution Effects of Polarimetric High Resolution X Band Data," *Proc. of POLInSAR 05*, Frascati, Italy, 2005.

P. Dubois-Fernandez, **F. Garestier**, I. Champion, X. Dupuis and P. Paillou, "Forest parameter retrieval from SAR data at L and P band : Polarimetry and PolInsar", *Proc. CEOS 2005*, Adelaide, Australia, September 2005.

P. Dubois-Fernandez, I. Champion, D. Guyon, H. Cantalloube, **F. Garestier**, X. Dupuis et G. Bonin, "Forest Biomass Estimation from P-Band High Incidence Angle Data," *Proc. of POLInSAR 05*, Frascati, Italy, 2005.

F. Garestier, P. Dubois-Fernandez, K. Papathannassiou et I. Hajnsek, "Analysis of High Resolution Single-Pass Polarimetric and Interferometric Data," *Proc. of BioGeoSAR 2004*, Innsbruck, Austria, 2004.

F. Garestier, P. Dubois-Fernandez, X. Dupuis and P. Paillou, "Influence of the Window Size on the Accuracy of the Interferometric Phase Estimation," *Proc. of Radar 04*, Toulouse, France, 2004.

P. Dubois-Fernandez, X. Dupuis, **F. Garestier**, P. Paillou, "Using PolInSAR at X-Band : Preliminary Observations," *Proc. of POLInSAR 03*, Frascati, Italy, 2003.

H. Cantalloube, E. Colin, V. Giroux, L. Pastore, **F. Garestier** et P. Dubois-Fernandez, "Polarimetric Repeat-Pass Interferometric Airborne UHF SAR Data Acquisition and Calibration," *Proc. of POLInSAR 05*, Frascati, Italy, 2005.

X. Dupuis, J. Morio, F. Goudail, **F. Garestier** and P. Dubois-Fernandez, "Entropy-Alpha Analysis using Automatic Pre-Segmentation procedure," *Proc. of POLInSAR 05*, Frascati, Italy, 2003.