

# Simon Tournier

Born the 23<sup>rd</sup> June 1983 in Montpellier (France)  
French

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<p style="text-align: center;"><b>Scientific Computing</b> <b>Computational Reproducibility</b> from Computational Electromagnetism and Acoustic to Biological data</p>
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## ACADEMIC BACKGROUND AND EXPERIENCES

- 2016 – ...** **Research Engineer** position at the Université de Paris Cité (ex. Paris 7 Diderot) in charge of numerical Core Facilities in biological wet laboratory :
- contribute to reproducible software deployment ;
  - support about bioinformatics tools : predictive modeling, clustering analysis of flow cytometry data, mapping of Next Generation Sequencing (NGS) data and variant calling ;
  - administrate 9 nodes cluster and desktop computers, management of large data sets from biological experiments.
- 2014 – 2016** **Post-doctoral** position at the PUC (Chile) [FONDECYT grant : 3150446] under the supervision of Prof. Carlos Jerez-Hanckes,  
*Efficient and Robust HPC Solver for Multiple Traces Formulations for Engineering Applications.*
- 2012 – 2014** **Post-doctoral** position at the Université de Liège (Belgium), in the ACE team, under the supervision of Prof. Christophe Geuzaine,  
*Study of some preconditioning techniques for Finite Elements Methods and Decomposition of Domain Method.*
- 2007 – 2012** **PhD** from Institut Supérieur de l’Aéronautique et de l’Espace (ISAE), Toulouse, under the supervision of Pierre Borderies (ONERA, Toulouse) and Jean-René Poirier (LAPLACE, Toulouse)  
Defended the 22<sup>nd</sup> March 2012 at SupAéro (ISAE), with the jury composed by : Abderrahmane Bendali, Pierre Borderies, Christophe Bourlier, Christophe Geuzaine, Luc Giraud, Jean-René Poirier, Jean-Yves Suratteau.  
**Title :** *Contribution of the modeling of the electromagnetic scattering by rough surfaces from rigorous methods.*
- 2007 7 months in EADS Innovation Works (Centre Commun de Recherches)  
Engineer intern under the supervision of Andrew Thain.
- 2006–2007 **Master of Science** (*magna cum laude*) in “ElectroMagnetism and OptoElectronics”, Institut National Polytechnique, Toulouse.  
Thesis under the supervision of Andrew Thain (EADS Innovation Works),  
*Numerical Simulations of antennas on large planes.*
- 2004 – 2007** **Engineer degree** in Electronics and Signal Processing, ENSEEIHT, Toulouse.
- 2001–2004 Preparatory Class for entrance in engineering school, Montpellier.  
*Personal Project : Modeling of 1D snow avalanche and numerical simulation by finite difference.*

## PUBLICATIONS

### Articles published under peer-review

- *Homogenization Techniques for Improving the Calculations of Scattering by 1-D Fast Oscillating Periodic Surfaces* – S. Tournier, J.-R. Poirier, P. Borderies  
IEEE Antennas and Propagation Vol. 67, No. 1, pp 430-437, 2019
- *Local Multiple Traces Formulation for High-Frequency Scattering Problems by Spectral Elements*, C. Jerez-Hanckes , J. Pinto, S. Tournier  
Scientific Computing in Electrical Engineering : SCEE 2014, Wuppertal, Germany, series Mathematics and Industry, Springer, pp. 73-82, 2016
- *GetDDM : an Open Framework for Testing Optimized Schwarz Methods for Time-Harmonic Wave Problems*, B. Thierry, A. Vion, S. Tournier, M. El Bouajaji, D. Colignon, N. Marsic, X. Antoine, C. Geuzaine  
Computer Physics Communications, Vol. 203, pp. 309-330, 2016

(see [www.onelab.info/wiki/GetDDM](http://www.onelab.info/wiki/GetDDM))

- *Local Multiple Traces Formulation for High-Frequency Scattering Problems*, C. Jerez-Hanckes, J. Pinto, S. Tournier *Journal of Computational and Applied Mathematics*, Vol. 289, pp. 306-321, dec. 2015
- *Modélisation de la diffusion électromagnétique par des surfaces rugueuses à partir de méthodes rigoureuses*, S. Tournier, P. Borderies, J.-R. Poirier *Revue d'Electricité et Electronique*, No. juin 2012  
(request by the journal for section "Jeunes Chercheurs")
- *Integral Equations Physically based Preconditioner for Two Dimensional Electromagnetic Scattering by Rough Surfaces*, S. Tournier, P. Borderies, J.-R. Poirier *IEEE Antennas and Propagation*, Vol. 59, No. 10, pp. 3764-3774, oct. 2011

#### Article submitted

- *Guix, an open package manager, provides functions to share computational bench and improve reproducibility in science* – N. Vallet, D. Michonneau, S. Tournier
- *Azithromycin promotes relapse by disrupting immune and metabolic networks during anti-tumor response after allogeneic hematopoietic stem cell transplantation* – N. Vallet, L. Bondeelle, A. Corneau, D. Bouteiller, S. Tournier, L. Derivry, A. Bohineust, M. Tourret, D. Gibert, S. Le Grand, R. Itzykson, B. Ingram, S. Cassonnet, P. Lepage, R. Peffault de Latour, G. Socie, A. Bergeron, D. Michonneau

#### International Conferences (with committee selection)

- **EFI/SPT 2019** Joint Meeting, Lisbon  
*Long-read nanopore sequencing of HLA class-I and -II amplicons for HLA typing*; V. Allain, S. Tournier, A. Alberdi, P. Loiseau, J.-L. Taupin, S. Caillat-Zucman, I. Theodorou, N. Setterblad
- **SIAM 2016** Annual Meeting, Boston  
*Multiple Traces Formulations : Novel Extensions and Challenges*; C. Jerez-Hanckes, S. Tournier
- **FACM 2016**, Newark  
*Multiple Traces Formulation : Preconditioning Strategies*; C. Jerez-Hanckes, S. Tournier
- **WAVES 2015**, Karlsruhe,  
*Preconditioning Techniques for Local Multiple Traces Formulation for Scattering Problems*; S. Tournier<sup>\*</sup>, J. Pinto, C. Jerez-Hanckes
- **WAVES 2015**, Karlsruhe,  
*Local Multiple Traces Modelling for High-Frequency Scattering*; C. Jerez-Hanckes, J. Pinto, S. Tournier
- **PANACM 2015**, Buenos Aires,  
*Multiple Traces Formulation for High-Frequency Scattering*; C. Jerez-Hanckes, J. Pinto, S. Tournier
- **IEEE ACAMA 2014**, Antibes Juan-les-Pins,  
*An Open Source Domain Decomposition Solver for Time-Harmonic Electromagnetic Wave Problems*; C. Geuzaine, B. Thierry, N. Marsic, D. Colignon, A. Vion, S. Tournier, Y. Boubendir, M. El Bouajaji, X. Antoine
- **SCEE 2014**, Wuppertal,  
*Local Multiple Traces Formulation for High-Frequency Scattering Problems*; C. Jerez-Hanckes, J. Pinto, S. Tournier
- **EuroEM 2012**, Toulouse,  
*Homogenization Techniques for Improving Electromagnetic Scattering Computation by Dielectric Surfaces*; S. Tournier<sup>\*</sup>, P. Borderies, J.-R. Poirier
- **AMPERE 2011**, Toulouse – Best Poster Award  
*Analysis of QR-compression Techniques for Improving Electromagnetic Scattering Computation by Periodic Rough Surfaces*; S. Tournier<sup>\*</sup>, J. Girardin, J.-R. Poirier, P. Borderies
- **PIERS 2010**, Cambridge,  
*Analysis of Homogenization Techniques for Improving Electromagnetic Scattering Computation by Rough Surfaces*; S. Tournier<sup>\*</sup>, P. Borderies, J.-R. Poirier
- **WAVES 2009**, Pau,  
*A Physically-based Preconditioner for 2D Electromagnetic Rough Surfaces Scattering Problems*; S. Tournier<sup>\*</sup>, P. Borderies, J.-R. Poirier
- **WAVES 2009**, Pau,  
*High order asymptotic expansion for the scattering of fast oscillating periodic surfaces*; J.-R. Poirier, A. Bendali, P. Borderies, S. Tournier
- **PIERS 2009**, Beijing,  
*Analysis of Performances of a Floquet Mode Preconditioner for Electromagnetic Scattering Computation by Rough Surfaces*; S. Tournier, J.-R. Poirier, P. Borderies
- **PIERS 2008**, Hangzhou,  
*Use of Numerical Methods for Assessing Validity Domains of the approximations Involved in Electromagnetic Interaction Modeling with vegetation*; P. Borderies, J.-R. Poirier, S. Tournier, C. Lauprette, L. Villard, P. Dubois Fernandez, N. Floury

## Organizing Committee Participation

- Café Guix – since Oct. 2021
- Atelier reproductibilité des environnements logiciels – Mai 2021
- Guix Days – Nov. 2020, Feb. 2022
- Reproducible Research Hackathon – Jul. 2020

**Reviewer** for IEEE Antennas and Propagation, IEEE Geoscience and Remote Sensing  
**Teaching** and **Mentoring** students since 2007.

## COMPUTER SKILLS

Regular contributor to **GNU Guix** and member to the **GuixHPC** initiative

<b>Scientific Programming</b>	<b>current daily use</b> :	Python, bash, Lisp, R
	<b>basic knowledge</b> :	Julia, Haskell, OCaml, Docker
<b>Tools</b>	<b>previously used</b> :	Numpy/Scipy, C, Fortran, C++,
	<b>ex. advanced user</b> :	Gmsh, GetDP, Bem++
	<b>visualizing</b> :	Matplotlib, ggplot
	<b>editing</b> :	L <sup>A</sup> T <sub>E</sub> X/B <sub>I</sub> B <sub>T</sub> E <sub>X</sub> , Markdown, Org, Emacs
	<b>version control</b> :	git, mercurial, subversion
	<b>debug</b> :	gdb, pdb, Valgrind, gprof
	<b>build automation</b> :	Makefile, CMake, Continuous Integration

## OTHERS

**voluntary of GÉNEPI**  
(from 2004 to 2009)  
[www.anciensdugenepi.fr](http://www.anciensdugenepi.fr)

Intervention in prison  
(*teaching, participation to an internal newspaper, sports*)  
Organization of events to talk about problems of prison  
(*intervention in high school, conferences, radio programme*)

participation to Colombbus  
[www.colombbus.org](http://www.colombbus.org)

Promotion of computer sciences in junior secondary school using Free Software

Miscellaneous

Mountain (hiking, climbing)

## REFERENCES

**Jean-René Poirier**  
LAPLACE – INPT-ENSEEIH  
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FR-31071 Toulouse, Cedex 7, France  
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