

ABRY PATRICE - CURRICULUM VITAE

Personal Data

Date and Place of Birth June, 16th, 1966, Bourg-en-Bresse, France,
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Career

Depuis 2005 CNRS, Research Director, second class,
Depuis 2004 In charge of the SYSSIPHE research team,
1999-2005 CNRS, Research Associate, first class,
1995-1999 CNRS, Research Associate, second class,
1991-1995 *Professeur agrégé*
1886-1990 Student at the Ecole Normale Supérieure de Cachan.

Formation

2001 HABILITATION À DIRIGER LES RECHERCHES, Claude-Bernard
Lyon I University, Ecole Normale Supérieure de Lyon,
1994 PHD THESIS, université Claude-Bernard Lyon I,
1991 DIPLÔME D'ETUDES APPROFONDIES, Claude-Bernard Lyon I
University, Ecole Normale Supérieure de Lyon,
1989 *Agrégation* IN PHYSICAL SCIENCES (national rank : 4th), Ecole
Normale Supérieure de Cachan.

National and International Scientific Awards

- 2007** Invited Lecture at a public sequence of the French Academy of Sciences : *Advances in Information Sciences, presented by their authors,*
- 2007** *Young Research Team* funding, granted by the del Duca foundation, under the control of the French Academy of Sciences,
- 2000** EURASIP (EUROpean Association for SIngal Processing) Best Paper Award for the year 2000,
- 1994** Best PhD Thesis in Automatic and Signal Processing for the years 1993 and 1994, granted jointly by CNRS (National Council for Scientific Research), AFCET (French Association for Automatic) and the French Ministry of Education, Research and Technology.

Scientific Productions

- **Patent** : *Real-Time Estimation of Long Range Dependent Parameters*, AU1998PP01692, 05/02/1999, Inventors : D. Veitch, M. Roughan, P. Abry, Demandeurs : Ericsson Australia Pty. Ltd, Royal Melbourne Institute of Technology limited Melbourne, VIC 3000 / AU, Centre National de la Recherche Scientifique (CNRS), Paris Cedex 16 / FR.
- **Software Protection** : *Analyse du trafic par sketch-multirésolution*, registered at *Agence pour la Protection des Programmes*, by CNRS and ENS de Lyon, 13/08/2007, P. Abry, P. Borgnat, G. Dewaele.
- **Sharewares** :
(available at perso.ens-lyon.fr/patrice.abry, cf. section ??)
 - MATLAB codes for *the synthesis of fractional Brownian motion*,
 - MATLAB codes for *the wavelet based analysis of scaling phenomena*.
- **Scientific Publications**, up to July 2010 (last 10/4 years) :
 - H-factor : 15, Scopus, 15/07/2010,
 - H-factor : 14, ISI Web of science, 15/07/2010,
 - 1 (1/0) book (in French) as author,
 - 2 (2/1) books (English/French) as editor,
 - 2 (2/1) scientific vulgarization articles, in French for *La Recherche*, March 2005, in English for the *Proceedings of the IEEE*, may 2002,
 - 43 (34/16) peer reviewed research articles published in international Journals,
 - 1 (1/0) peer reviewed research article published in an electronic international Journal,
 - 16 (12/4) peer reviewed research articles published as book chapters,
 - 73 (55/27) peer reviewed research articles published in the proceeding of international Conferences.
- **Co-authors** More than 35 co-authors :
 - working in France, Europe, South-East and far East Asia, Australia, North and South America,
 - working in Mathematics, Statistics, Electrical Engineering, Fluid Dynamics, Ionospheric Physics, , Biology, Medicine , computer science departements.

Invited Conferences

- **Scientific Vulgarisation Conferences** : 2 invited conferences, in 2007. Liste below.
- **international Conferences** : Since 1997, 42 invited lectures in international Conferences or Summer Schools. Liste below.
- **Lab. Seminars** : Since 1994, numerous and regular invited seminars and short/medium duration visits in international research labs. Liste below.

Research Themes and Results

- Semi- and bi-orthogonal Wavelet Basis Design (92-97).
- Wavelet, self-similarité and long range dependence :
 - Efficient and robust low computational/memory cost on-line on-the-fly estimation, (93-98),
 - Wavelet synthesis for the fractional Brownian motion (94-96),
 - Long range dependence and Point processes (95-97).
 - Self-similar alpha-stable processes (99-03/06-07).
- Multifractal Analysis :
 - Infinitesimal divisible Processes and departure from exact scale invariance (00-04),
 - Linearization effect (03-04/07-09),
 - *Wavelet Leaders* (04-09),
 - Bootstrap-based confidence intervals and hypothesis tests (06-08),
 - Multifractal Analysis and fMRI (06-09)
 - Multifractal Analysis and Images (2D fields) (09-11).
- Hydrodynamic Turbulence :
 - Statistical versus Space-time intermittencies (98-00),
 - Multifractal Analysis and turbulence (04-07).
- Internet Traffic :
 - Analysis and robust estimation of long range dependence (98-03),
 - Security : Anomaly detection and Robust Analysis (04-09).
- Heart beat variability and baro-reflex regulation (01-07),
- Ionospheric gravito-acoustic wave detection (04-07).

Consulting

2004-2005 (12 mois) : *Impulsive signal classification*, **01dB METRAVIB RDS** , 69578 LIMONEST.

Langages

French mother tong,
English fluent,
Spanish intermediate,
German school level.

International Event Organization

- **Organizing Committee :**

- *Complexity in Physics/Physique de la complexité*, Lyon, France, 1-5 june 2009, complexity2009.ens-lyon.fr/. - *IEEE Statistical Signal Processing*, Madison, Wisconsin, USA, 2007, European liaison.
- *Wavelets and Multifractals Analysis*, Cargèse, Corsica, june 2004.
- *Sciences de l'Information et Physique non linéaire* (with P. Flandrin, P.-O. Amblard, A. Arnéodo et S. Zozor), 8-13 Septembre 2002, Les Houches, France.
- *1/f, long range dependent processes : From models to applications* (with P. Flandrin, J. Lévy Vehel, O. Michel), Avril 1996, Les Houches, France.

- **Program Committee :**

- *IEEE Statistical Signal Processing*, Madison, Wisconsin, USA, 2007.
- *GRETSI*, 2009, 2007, 2005.
- *EUSIPCO*, Firenze Italy, 2006.
- *SPIE Optics East, Wavelet Applications in Industrial Processing*, USA, 2003 à 2009.
- *Auto-Similarité et Applications, I et II*, Clermont-Ferrand, 2002, Toulouse, 2006.

- **Special Sessions in International Conferences :**

- *GRETSI*, special session on *Sensor Networks*, Dijon, september 2009.
- *Autosimilarité et Applications*, special session on *Scaling and Turbulence*, Toulouse, June 2005.
- *GRETSI*, special session on *Signal Processing and Internet Traffic*, Louvain-La-Neuve, septembre 2005.

— Scientific Research Administration —

- 2006-2007, member du *Jury du Prix de Thèse de la Section Signal-Images du club EEA*,
- Depuis décembre 2005, member du *comité d'experts en Traitement du Signal* du CNRS, <http://perso.enst.fr/cappe/CEMethodes/>,
- December 2005, *Appreciated Reviewer*, *IEEE Transactions on Signal Processing* Distinction,
- 2005-2009, Editeur associé de *IEEE Transactions on Signal Processing*,
- Since 2005, Editeur associé de *EURASIP Signal Processing*,
- 2004-2010, member of the SPTM (Signal Processing techniques and Methods) committee of the IEEE Signal Processing Society.
- 2005-2010, member of the *commission des thèses* at ENS de Lyon,
- Since 2004, member of the Physics Dept. Council at ENS de Lyon, France,
- Since 2001, Expert-Evaluator for the European Commission Research Directorates General - ISTC Evaluations.
- 2000-2005, member of the *commission de Spécialistes de Physique* at ENS de Lyon, France.

— Research Program Direction —

- Since 2006, significant commitment in French-Japanese bilateral programs CNRS-WIDE, <http://cnrs.wide.ad.jp/>.
- 2006-2009, ANR RNRT OSCAR, Overlay networks Security : Characterization, Analysis and Recovery,
- 2005-2006, bilateral CNRS/ASRT program between the French and Czech Academy of Sciences, CNRS DRI project 18098.
- Since 2004, in charge of the SiSYPHE Research Team.
- 2004-2007, co-direction (with P. Owezarski) of the ACI program *Metrology for Security on the Internet Network*,
<http://www.laas.fr/METROSEC/>.
- 2002-2003, co-direction (with P. Owezarski) of the *Action Spécifique 88 CNRS Internat Network Metrology/Métrie des réseaux de l'internet*,
<http://perso.ens-lyon.fr/patrice.abry/asmetro.html>.
- 1999-2002, ACI program *Jeune Chercheur Scaling Phenomena and Multiplicative Cascades : from Hydrodynamic Turbulence to Computer Network Traffic*,
- 1999-2002, co-direction (with P. Gonçalvès) of the *Groupe de Travail/Working Group* within GdR ISIS *Wavelets and Fractals*.

PhD Thesis direction

- **Herwig Wendt**, *Contributions of wavelet Leaders and bootstrap to multifractal analysis*. presented on september, 23rd, 2008.
- **Bruno Lashermes**, *Analyse Multifractale pratique : coefficients dominants et ordres critiques. Applications à la turbulence pleinement développée. Effet de nombre de Reynolds fini*. presented on october, 14th, 2005.
- **Pierre Chainais**, *Cascades log-infiniment divisibles et analyse multirésolution. Application à l'étude des intermittences en turbulence*. 21 novembre, 21st, 2001.

Teachings

- Participation à la **creation** of all the courses in **Statistical Signal Processing** and **Data Analysis** at the *sciences de la Matière* Dept. at ENS de Lyon. Per year, 3 courses of 12h.

Invited Conferences since 2001

1. *Conference in Analysis and its Applications*, May 25 - 27, 2009, Indian Institute of Science, India, Bangalore, <http://math.iisc.ernet.in/imi/atp-Analysis.conference.htm>
2. *Workshops IV : New Mathematical Frontiers in Network Multi-Resolution Analysis*, IPAM, UCLA, USA, 15/11/2008 à 24/11/2008.
<https://www.ipam.ucla.edu/schedule.aspx?pc=MRAWS4>
3. *IMS Wavelet Theory and Applications*, NU Singapore, 09-14/06/08
4. *Cycle de conférences fractales*, Cité des Sciences, 11 mars 2008, Paris.
www.cite-sciences.fr/francais/ala_cite/college/v2/html/2007_2008/cycles/cycle_267.htm
5. *Séance publique de l'Académie des Sciences Avancées en sciences de l'information, par leurs auteurs*, 5 juin 2007, Paris.
6. *International Symposium on Applications and the Internet*, Hiroshima, Japon 15-19 jan. 2007.
7. *International Conference Harmonic Analysis and Applications* *Savo Encuentro Nacional de Analistas A.P. Calderón*, 30 juillet au 5 août 2006, San Luis, Argentine.
8. *INTIMATE Workshop*, Organismes : C. Diot, Thomson, S. Fdida, LIP6, Paris VI, Paris, 6-7 juillet 2006.
9. *Semestre WAVE 2006*, EPFL, Lausanne, 20 avril 2006.

10. *Taller sobre Multifractalidad y Autosimilaridad*, 19–23 juillet 2005, Caracas (Venezuela). Organismes : Universidad Central de Venezuela (J. Léon, C. Ludena).
11. *International Symposium on Applications and the Internet*, Hiroshima, Japon 15-19 janvier 2007.
12. *International Conference Harmonic Analysis and Applications* *Savo Encuentro Nacional de Analistas A.P. Calderón*, 30 juillet au 5 août 2006, San Luis, Argentine.
13. *INTIMATE Workshop*, Organismes : C. Diot, Thomson, S. Fdida, LIP6, Paris VI, Paris, 6-7 juillet 2006.
14. *Semestre WAVE 2006*, EPFL, Lausanne, 20 avril 2006.
15. *Taller sobre Multifractalidad y Autosimilaridad*, 19–23 juillet 2005, Caracas (Venezuela). Organismes : Universidad Central de Venezuela (J. Léon, C. Ludena).
16. *Mathematical Foundations of Internet*, 19–21 novembre 2004, Moscou (Russie). Organismes : laboratoire international franco-russe de mathématiques et informatique, DRI, CNRS.
17. *Journées MAS SMAI Contrôle Stochastique et Statistique*, 6–8 septembre 2004, Nancy (France).
18. *SPIE04 Optic East : Wavelet Applications in Industrial Processing II*, 26-28 octobre 2004, Philadelphie (USA).
19. *Wavelets and Multifractal Analysis*, 19–31 juillet 2004, Cargèse (France). Organismes : P. Flandrin, R. Baraniuk, P. Gonçalves, S. Jaffard, P. Abry.
20. *Complexité et Mesures de l'Internet*, 25 juin 2004, Paris (France), Organisme : E. Guichard.
21. *Computational and Harmonic Analysis*, 24–30 mai 2004, Nashville (USA). Organisme : A. Aldroubi, Van der Bilt University.
22. *Power Laws and Statistics*, 22–26 mars 2004, Luminy (France). Organisme : Ph. Soulier, CIRM.
23. *SAMSI Workshop Internet Tomography and Sensor Network*, 19–21 Octobre 2003, Caroline du Nord (USA). Organisme : S. Marron, SAMSI.
24. *Wavelet and Scaling : Introduction and review*, 15–19 juin 2002, Prague (république tchèque). Organisme : Institut de physique de l'atmosphère.
25. *International Conference on Long Range Dependent Stochastic Processes*, 3–10 janvier 2002, Bangalore (Inde). Organisme : R. Rangajaran.
26. *Data analysis techniques for space plasma data*, 15–22 octobre 2001, La Londe - Les Maures (France). Organisme : T. Tudok.
27. *IIIème Journée Climat et Statistiques de l'Institut Pierre Simon Laplace : Valeurs Extrêmes et Ondelettes*, 19 Juin 2001, Paris (France).
28. *Nouveaux concepts de signal image pour les sciences et technologies de l'information, Télétrafic informatique : invariance d'échelle et ondelettes*, Avril 2001, Paris (France). Organisme : ASTI.

— Visits in International Research Labs. —

- National Institute of Information, Tokyo, Japon, 16/04/2009 to 21/04/2009, collaboration with K. Fukuda(NII) and K. Cho (IIJ).
- IPAM, UCLA, USA, 15/11/2008 à 24/11/2008.
- National Institute of Information, Tokyo, Japon, 13/03/2008 to 22/03/2008, collaboration with K. Fukuda(NII) and K. Cho (IIJ).
- Dept. of Electrical Engineering, university of Melbourne, Australia, 18 november-5 december 2006.
- Atmospheric Physics Lab., Prague, 3-10 november 2006.
- Math. Dept., University of North Carolina, USA, 9-17 october 03, collaboration with V. Pipiras.
- Atmospheric Physics Lab., Prague, 7-22 june, 03. collaboration with P. Sauli, J. Boska, J. Lastoviska.
- Atmospheric Physics Lab., Prague, 2-12 june, 02. collaboration with P. Sauli, J. Boska, J. Lastoviska.
- Dept. of Electrical Engineering, université de Melbourne, Australie, 5 weeks, october-november 01.
- Newton Institute, Cambridge, UK, 1 week, may 99.
- National Institute of Health, Washington, USA, 1 week, april 98.
- Université de Entre-Rios, Parana, Argentine, 2 weeks, december 97.
- Dept. of Electrical Engineering, université de Rice, Houston, USA, 2 weeks, june 97.
- Dept. of Electrical Engineering, université de Melbourne, Australie, 4 weeks, april 97.
- National Institute of Health, Washington, USA, 1 week, march 96.

Patrice Abry,
Lyon, July 2010.