ABRY Patrice - Curriculum Vitae

Personal Data

Date and Place of Birth	June, 16th, 1966, Bourg-en-Bresse, France,
Citizenship	French,
Marital Status	married, one child,
Adress/Phone	17, rue de Saint Cloud, 69007 Lyon, France/ 33 47858 1557

Professional Address

Research Unit	Physics Departement,
Institut	Ecole Normale Supérieure de Lyon.
Professional Address	46, allée d'Italie, 69364 Lyon, cedex 7, France.
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Career

2010-	CNRS, Research Director, first class,
2005-2010	CNRS, Research Director, second class,
Since 2004	In charge of the SySiPhe 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.

Education and Diploma

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.

Languages

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

Scientific Awards

2011 IEEE Fellow,

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 fundation, under the control of the French Academy of Sciences,

2000 EURASIP (EURopean Association for SIgnal 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 Eductation, 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 Rercherche Scientitique (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.

• **Shareware :**

(available at `perso.ens-lyon.fr/patrice.abry`)

- MATLAB codes for *the synthesis of fractional Brownian motion,*

- MATLAB codes for *the wavelet based analysis of scaling phenomena.*

- MATLAB codes for *Multifractal Analysis.*

- MATLAB codes for *the synthesis of multivariate time series.*

• **Scientific Publications**, up to Dec. 2012 :

- H-factors (31/12/2012) : ISI Web of science : 17 ; Scopus : 18 ; GoogleScholar : 35.

- 1 book (in French) as author,

- 2 books (English/French) as editor,

- 3 scientific vulgarization articles, in French for *La Recherche*, March 2005 and December 2011, in English for the *Proceedings of the IEEE*, May 2002,

- 55 peer reviewed research articles published in international journals,

- 2 peer reviewed research articles published in electronic international journals,

- 19 peer reviewed research articles published as book chapters,

- 85 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, Physics, Statistics, Electrical Engineering, Fluid Dynamics, Ionospheric Physics, Biology, Medicine, Computer Sciences, or Human Sciences Departements.

Research Topics and Results

- Semi- and bi-orthogonal Wavelet Basis Design (92-97).
- Wavelet, self-similarity 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),
- Multivariate Self-similar processes (09-).
- Non Gaussian finite variance Self-similar processes (12-).
- Multifractal Analysis :
- Infiniment divisible Processes and departure from exact scale invariance (00-04),
- Linearization effect (03-04/07-09),
- *Wavelet Leaders* (04-),
- Bootstrap-based confidence intervals and hypothesis tests (06-08),
- Multifractal Analysis and Images (2D fields) (09-).
- Multifractal Analysis and Paintings (11-).
- Multifractal Analysis and of Self-similar processes (10-)
- Random Processes Synthesis :
- Fractional Brownian motion by wavelets (98-00),
- Multivariate non Gaussian time series with prescribed marginal and covariances (09-11),
- Random Fields (10-,
- Multivariate time series with prescribed joint distributions (11-).
- Statistical Physics and Signal Processing :
- Extrema and sums for heavy tail random variables (10-),
- Phase transitions and linearization effects (10-),
- Stochastic vectors from product of matrices (10-).
- 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),
- Synthesis : Agregated traffic time series synthesis (05-),
- Classification : Internet application characterization (09-).
- Other Applications :
- Ionospheric gravito-acoustic wave detection (04-11),
- Velo'V Complex System Annalysis (09-),
- Heart beat variability and baro-reflex regulation (01-07),
- Multifractal Analysis and fMRI (07-),
- Intrapartum fetal heart rate analysis (10-),
- Multifractal Analysis and Paintings (11-).

Invited Conferences

- **Scientific Vulgarisation Conferences :** 2 invited conferences, in 2007. Liste below.
- **international Conferences :** Since 1997, 45 invited lectures in internationals Conferences or Summer Schools.
- **Lab. Seminars :** Since 1994, numerous and regular invited seminars and short/medium duration visits in international research labs.

International Event Organization

- **Guest Editor :** for European Signal Processing, Special Issue on "Image Processing for Digital Art Work Investigation", 2013.

- **Organizing Committee :**
- *Complexity in Phyics/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*, 2013, 2011, 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 :**
- *EMBC*, Minisymposium on *Complexity in Biomedical Signals*, Osaka, Japan, 2013
- *GRETSI*, special session on *Sensor Networks*, Dijon, France, 2009.
- *Self-similarity and Applications*, special session on *Scaling and Turbulence*, Toulouse, France, 2005.
- *GRETSI*, special session on *Signal Processing and Internet Traffic*, Louvain-La-Neuve, Belgium, 2005.

PhD Thesis direction

- **Aude Costard** started October 2011.
- **Florian Angeletti,** presented on December, 6th, 2013.
- **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 to the **creation** of all the courses in **Statistical Signal Processing** and **Data Analysis** at the *Physiscs* Dept. at ENS de Lyon. Per year, 3 courses of 12h.

Patrice Abry,
Lyon, December 2012.