

# SCIENCES

## SCIENCES

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## ISTE Group Contacts

Sami Ménascé – President & CEO – [s.menasce@iste.co.uk](mailto:s.menasce@iste.co.uk)

Raphaël Ménascé – Vice-President – +44 208 879 4588 – [r.menasce@iste.co.uk](mailto:r.menasce@iste.co.uk)

Chantal Ménascé – Editorial and General Administration

+44 208 879 4582 – [c.menasce@iste.co.uk](mailto:c.menasce@iste.co.uk)

Rebecca Edge – Global Publication Manager

+44 208 879 4585 – [r.edge@iste.co.uk](mailto:r.edge@iste.co.uk)

Ludovic Moulard – Information and OpenScience Journals

+44 208 879 4584 – [l.moulard@iste.co.uk](mailto:l.moulard@iste.co.uk)

Maggy Trognon – Books Pre-production

+33 9 51 27 25 51 – [m.trognon@iste-editions.fr](mailto:m.trognon@iste-editions.fr)

Margot Dhennin – French Titles Production

+44 208 879 4586 – [m.dhennin@iste-editions.fr](mailto:m.dhennin@iste-editions.fr)

Michael Davis – English Titles Production

+44 208 879 4597 – [m.davis@iste.co.uk](mailto:m.davis@iste.co.uk)

## ISTE Group • Éditeur des Sciences – Science Publisher



27-37 St George's Road – London SW19 4EU — United Kingdom

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The ambition of Diderot and others from the Age of Enlightenment was to pass on all of human knowledge. Today however, at the start of the 21st Century, this dream has become impossible to achieve. There are more researchers alive today than there has ever been, and many of the most active are French. The CNRS is one of the most published organizations in the world, along with the Chinese Academy of Science, and its system of mixed research teams linked with major research universities is an extraordinary source of creativity and innovation.

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SCIENCES is open to new, real-time, knowledge and will thus be constantly evolving according to new discoveries.

Jean-Charles Pomerol  
President of the Scientific Committee of ISTE  
and former President of UPMC, Paris (2006-2011)

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A graphic with a dark background featuring a glowing blue globe, several open books, and scattered papers. The text 'Editorial Organization' is written in white, bold, sans-serif font, underlined, and 'Scientific Committee' is written below it in the same style.

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Marie-Christine Maurel, Sorbonne Université et MNHN, Paris

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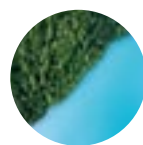
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Department  
**Biology, Medicine and Health**

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*Fields and Directors*

**Biology**

Marie-Christine Maurel, Sorbonne Université and MNHN, France

**Health and Society**

Bruno Salgues, Institut Mines-Télécom, France

**Medical Techniques**

Yves Rémond, Université de Strasbourg, ECPM, CNRS, France

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## Biology

*Field Director*

**Marie-Christine Maurel**

Sorbonne Université et MNHN, France  
marie-christine.maurel@sorbonne-universite.fr

### *Subjects and Subject Heads*

Animal Biology

Bioethics

Marie-Geneviève Pinsart, Université Libre de Bruxelles – Marie-Genevieve.Pinsart@ulb.ac.be

Bioinformatics – Modeling

Fabrice Leclerc, CNRS-Orsay, France – fabrice.leclerc@u-psud.fr

Cellular Biology

Evolution

Philippe Grandcolas, CNRS-ISYEB, France – pg@mnhn.fr

Steve Trewick, Massey University, New Zealand – S.Trewick@massey.ac.nz

Genetics, Epigenetics

Bernard Dujon, Institut Pasteur, Sorbonne Université, France – bernard.dujon@pasteur.fr

Immunology, Host-Pathogen Relations

Integrative Biology and Neurosciences

Carole Saintomé, Sorbonne Université – carole.saintome@sorbonne-universite.fr

Fabrice Leclerc, CNRS – Orsay, France – fabrice.leclerc@u-psud.fr

Microbiology

Molecular, Structural and Biochemical Biology

Pharmacology, Toxicology, Biological Analysis

Physiology, Reproduction, Development

Plantae and Photosynthesis

Brigitte Meunier-Gontero, CNRS-Marseille, France – bmeunier@imm.cnrs.fr

Stem Cells, Aging, Rare Genetic Diseases, Oxidative Stress

Miria Ricchetti, Institut Pasteur, France – miria.ricchetti@pasteur.fr

Synthetic Biology, Biotechnology

Systematics, Phylogenomics and Taxonomy

Daniel Faith, The Australian Museum Research Institute, Australia – danfaith9@yahoo.com.au

Philippe Grandcolas, CNRS-ISYEB, France – pg@mnhn.fr

Virology

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## Biology *(cont'd)*

### *Subjects and Subject Heads*

*Felix Rey, Institut Pasteur, France – felix.rey@pasteur.fr*

*Carla Saleh, Institut Pasteur, France – carla.saleh@pasteur.fr*

Xenobiology, Exobiology, Astrobiology, Origins of Life

Marie-Christine Maurel, Sorbonne Université-ISYEB, France – marie-christine.maurel@sorbonne-universite.fr

Marc Ollivier, IAS (Institut d'Astrophysique Spatiale), France – marc.ollivier@ias.u-psud.fr



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## Health and Society

*Field Director*

**Bruno Salgues**

Institut Mines-Télécom, France

bruno.salgues@gmail.com

### *Subjects and Subject Heads*

#### Economy, Innovation and Management in Health

*Robert Picard, Ministère des finances, Paris – rp.01@orange.fr*

#### Health Changes and Resistances

*Bruno Salgues, Institut Mines-Télécom, France – bruno.salgues@gmail.com*

#### Health Professionals

*Michel Mondain, CHU de Montpellier, Université de Montpellier, France – m-mondain@chu-montpellier.fr*

#### Knowledge Management and Ethics

*Jérôme Beranger, ADEL, France – jeromeberanger@hotmail.com*

#### Regulation and Medical Standards

*Laure Beyala, GFAOP, Institut Gustave Roussy, Villejuif, France – beyalalaure12@gmail.com*

#### Treatments and Medicines in Health Policy

*Marianne Sarazin, INSERM et UPMC – marianne.sarazin@iplesp.upmc.fr*

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## Medical Techniques

*Field Director*

**Yves Rémond**

Université de Strasbourg, ECPM, CNRS, France  
Yves.REMOND@cncs-dir.fr

### *Subjects and Subject Heads*

#### Biotechnology and Bioengineering

*Pascal Sommer, Institut des Sciences du Mouvement, Faculté des Sciences du Sport, France – pascal.sommer@univ-amu.fr*

#### Diagnostic and Imagery

*Luc Darrasse, IR4M, Orsay, France – luc.darrasse@u-psud.fr*

#### Drug Development

*Jean-Luc Galzi, CNRS, BSC, Université de Strasbourg – jean-luc.galzi@unistra.fr*

#### E-Health

#### Technologies for Surgery

*Jean-Christophe Lutz, CHU de Strasbourg, Hospices Civils, France – lutz0@me.com*

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Department  
**Chemistry**

---

*Fields and Directors*

**Agronomy and Food Science**

Jack Legrand, GEPEA, Université de Nantes, France

Gilles Trystram, AgroParisTech, France

**Chemistry**

Gilberte Chambaud, Université Paris-Est Marne-la-Vallée, France

# SCIENCES



## Agronomy and Food Science

*Field Directors*

**Jack Legrand**

Université de Nantes, France  
jack.legrand@univ-nantes.fr

**Gilles Trystram**

AgroParisTech, France  
gilles.trystram@agroparistech.fr

### *Subjects and Subject Heads*

#### Agronomy

Yves Coquet, AgroParisTech – yves.coquet@agroparistech.fr  
Jean Roger Estrade, AgroParisTech – jean.roger\_estrade@agroparistech.fr  
Marianne Lebail, AgroParisTech – marianne.lebail@agroparistech.fr

#### Agro-food Processing Engineering and Sustainable Development

*Philippe Bohuon, Montpellier SupAgro, France – philippe.bohuon@supagro.fr*

#### Control and Management of Food Processes

*Ioan Cristian Trelea, AgroParisTech – ioan-cristian.trelea@inra.fr*  
*Gilles Trystram, AgroParisTech – gilles.trystram@agroparistech.fr*

#### Food Bioprocesses

Mohamed Ghoul, ENSAIA - Université de Lorraine Nancy, France – mohamed.ghoul@univ-lorraine.fr

#### Food Chain Management

Jean-Marc Ferrandi, ONIRIS Nantes, France – jean-marc.ferrandi@oniris-nantes.fr

#### Food Chains

Thomas Croguennec, AgroCampus Ouest, France – thomas.croguennec@agrocampus-ouest.fr  
Catherine Renard, INRA Avignon, France – catherine.renard@inra.fr  
Véronique Verrez, IFREMER, France – veronique.verrez@ifremer.fr  
Sylvie Swyngedau Chevallier, ONIRIS Nantes, France – sylvie.chevallier@oniris-nantes.fr  
Véronique Sante-Lhoutellier, INRA Theix, France – veronique.sante-lhoutellier@inra.fr

#### Food and Functional Food Engineering

Philippe Cayot, AgroSup Dijon, France – philippe.cayot@agrosupdijon.fr

#### Food Science, Food Materials Science

*Gérard Cuvelier, AgroParisTech, France – gerard.cuvelier@agroparistech.fr*

#### Health Safety

Thierry Benezech, INRA Lille, France – thierry.benezech@inra.fr  
Jeanne-Marie Membré, INRA Nantes, France – jeanne-marie.membre@oniris-nantes.fr

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## Agronomy and Food Science (*cnt'd*)

### *Subjects and Subject Heads*

#### Nutrition, Diet

Nicolas Darcel, AgroParisTech, France – [nicolas.darcel@agroparistech.fr](mailto:nicolas.darcel@agroparistech.fr)

#### Packaging and Recycling

Frédéric Debeaufort, AgroSup Dijon, France – [frederic.debeaufort@u-bourgogne.fr](mailto:frederic.debeaufort@u-bourgogne.fr)

#### Sensory Qualities of Food

Loïc Briand, INRA Dijon – [loic.briand@inra.fr](mailto:loic.briand@inra.fr)

Elisabeth Guichard, INRA Dijon – [elisabeth.guichard@inra.fr](mailto:elisabeth.guichard@inra.fr)

Christian Salles, INRA Dijon – [christian.salles@inra.fr](mailto:christian.salles@inra.fr)

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## Chemistry

*Field Director*

**Gilberte Chambaud**

Université Paris-Est Marne-la-Vallée, France  
gilberte.chambaud@u-pem.fr

### *Subjects and Subject Heads*

#### Analytical Chemistry

Nicole Jaffrezic, Université Lyon 1, France – nicole.jaffrezic@univ-lyon1.fr

#### Catalysis

Catherine Pinel, IRCELYON, France – catherine.pinel@ircelyon.univ-lyon1.fr

#### Chemical Analytical Techniques

#### Chemistry and Life Sciences

Philippe Karoyan, UPMC Paris – philippe.karoyan@upmc.fr

#### Chemistry of Natural Compounds

#### Materials Chemistry

George Hadziioannou, Université de Bordeaux, France – hadzii@enscbp.fr

#### Radical Chemistry

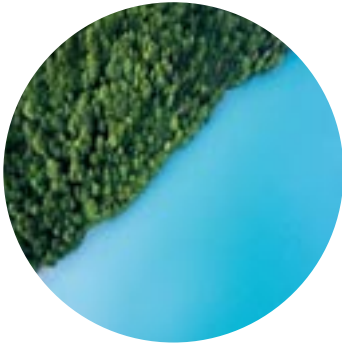
Didier Gigmes, Aix Marseille Université, France – didier.gigmes@univ-amu.fr

#### Theoretical Chemistry and Calculations

Jean-François Halet, Université de Rennes, France – jean-francois.halet@univ-rennes1.fr



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Department  
**Ecology and Environment**

---

*Fields and Directors*

Ecosystems and Environment

Françoise Gaill, CNRS MNHN, Sorbonne Université, France

Dominique Joly, CNRS INEE, Paris, France

Environment and Health

Yann Voituron, Université Claude Bernard - Lyon I, France

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## Ecosystems and Environment

*Field Directors*

**Françoise Gaill**

CNRS MNHN, Sorbonne Université, France  
francoise.gaill@cnrs-dir.fr

**Dominique Joly**

CNRS INEE, Paris, France  
dominique.joly@cnrs-dir.fr

### *Subjects and Subject Heads*

#### Adaptation

*Fabienne Aujard, CNRS-MNHN, France – aujard@mnhn.fr*

#### Alimentation

*Fabienne Aujard, CNRS-MNHN, France – aujard@mnhn.fr*

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Biodiversity

*Fabienne Aujard, CNRS-MNHN, France – aujard@mnhn.fr*

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Biological Invasions

#### Functional Ecology

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Global Changes

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Historical Ecology

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Ecophysiology

*Fabienne Aujard, CNRS-MNHN, France – aujard@mnhn.fr*

#### Environment, Natural or Anthropogenic Pressures

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*

*Sylvie Rebuffat, CNRS-MNHN, France – sylvie.rebuffat@mnhn.fr*

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## Ecosystems and Environment (*cnt'd*)

### *Subjects and Subject Heads*

#### Environmental Ecochemistry

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*  
*Sylvie Rebuffat, CNRS-MNHN, France – sylvie.rebuffat@mnhn.fr*

#### Environmental Genomics

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*

#### Epigenetics

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Evolution

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Sustainable Interactions

*Denis Faure, CNRS, France – Denis.FAURE@i2bc.paris-saclay.fr*  
*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*  
*Sylvie Rebuffat, CNRS-MNHN, France – sylvie.rebuffat@mnhn.fr*

#### Social Ecosystems

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

#### Symbioses

*Sylvie Rebuffat, CNRS-MNHN, France – sylvie.rebuffat@mnhn.fr*

#### Urban Ecosystems

*Dominique Joly, CNRS INEE, Paris, France – dominique.joly@cnrs-dir.fr*

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## Environment and Health

*Field Director*

**Yann Voituron**

Université Claude Bernard - Lyon I, France  
yann.voituron@univ-lyon1.fr

### *Subjects and Subject Heads*

Ecotoxicology of Wild and Domesticated Fauna

Emerging Pollution

Microbial Resistance to Antibiotics

Urbanity and Health

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## Department Information and Communication

### *Fields and Directors*

#### Computer Science

Valérie Berthé, Université Paris Diderot, France

Jean-Charles Pomerol, Sorbonne Université, France

#### Scientific Knowledge Management

Renaud Fabre, professeur des universités, France

# SCIENCES



## Computer Science

*Field Directors*

**Valérie Berthé**

Université Paris Diderot, France  
berthe@irif.fr

**Jean-Charles Pomerol**

Sorbonne Université, France  
jean-charles.pomerol@sorbonne-universite.fr

### *Subjects and Subject Heads*

#### Agents, Objects, Web Objects

Amal El Fallah Seghrouchni, Sorbonne Université, France – amal.elfallah@lip6.fr

#### Algorithms

#### Artificial Vision, Pattern Recognition

Charles-Edmond Bichot, LIRIS, École centrale de Lyon – charles-edmond.bichot@ec-lyon.fr

#### Automata, Logic and Games

Olivier Serre, IRIF, Université Paris Diderot, France – Olivier.Serre@irif.fr

#### Bioinformatics

Anne Siegel, CNRS Rennes, France – anne.siegel@irisa.fr

Hélène Touzet, CNRS, France – helene.touzet@univ-lille.fr

#### Chips / Architecture, Design, Verification, Programming

Patrick Garda, Sorbonne Université, France – Patrick.Garda@lip6.fr

#### Cryptography, Data Security

Damien Vergnaud, LIP6, Sorbonne Université, France – damien.vergnaud@sorbonne-universite.fr

#### Databases, Data Analysis, Information Retrieval

#### Digital Documentation

Fabrice Papy, Université de Lorraine, France – fabrice.papy@univ-lorraine.fr

#### Digital Medias

Imad Saleh, Université Paris 8, France – idsaleh@orange.fr

#### High Performance Scientific Computing

Serge Petiton, Université Lille 1, France – serge.petiton@univ-lille1.fr

#### Information Systems

Florence Sèdes, IRIT, Université Paul Sabatier, France – florence.sedes@irit.fr

Camille Rosenthal-Sabroux, Université Paris-Dauphine, France – camille.rosenthal-sabroux@dauphine.fr

Damien Trentesaux, Université de Valenciennes, France – Damien.Trentesaux@uphf.fr

#### Learning, Data Mining and Big Data



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## Computer Science *(cont'd)*

### *Subjects and Subject Heads*

Machines, Architecture, Operating Systems

Man / Machine Interactions

Christophe Kolski, LAMIH, Université Polytechnique Hauts-de-France, [Christophe.Kolski@uphf.fr](mailto:Christophe.Kolski@uphf.fr)

Medical Computing

Operational Research and Decision

Patrick Siarry, Université Paris-Est Créteil, France – [siarry@u-pec.fr](mailto:siarry@u-pec.fr)

Programming and Software Engineering

Quantum Computing

Real-time, Synchronous Languages, Embedded Computing

Secure Software and Software Verification

Laure Petrucci, Université Paris 13, France – [laure.petrucci@lipn.univ-paris13.fr](mailto:laure.petrucci@lipn.univ-paris13.fr)

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## Scientific Knowledge Management

*Field Director*

**Renaud Fabre**

professeur des universités, France  
renaud.fabre01@gmail.com

### *Subjects and Subject Heads*

Data, Digital and Knowledge Law

Sarah Lenoir, Lexing Alain Bensoussan Avocats, France – Sarah-lenoir@alain-bensoussan.com

Knowledge Exploration and Analysis

Daniel Egret, Observatoire de Paris, France – Daniel.egret@obspm.fr

The Knowledge Factory

Patrice Bellot, Université Aix-Marseille, France – Patrice.bellot@univ-amu.fr

Knowledge Sharing and Technology

Herbert Gruttemeier, OpenEdition, France – Herbert.Gruttemeier@inist.fr

Strategic and Qualification Approaches for Digital Science

Renaud Fabre, consultant, France – renaud.fabre01@gmail.com

Transformations Dynamics of Tools and Uses

Joachim Schopfel, Université de Lille, France – Joachim.schopfel@univ-lille3.fr

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## Department **Engineering and Systems**

### *Fields and Directors*

#### Chemical Engineering

Jean-Claude Charpentier, LRGP, ENSIC, Université de Lorraine, France

#### Energy

Alain Dollet, Promes-CNRS, France

Pascal Brault, CNRS-GREMI, France

#### Image

Laure Blanc-Féraud, Université Côte d'Azur, CNRS, Inria, I3S, France

#### Materials Science

Jean-Pierre Chevalier, CNAM, France

#### Mechanics

Gilles Pijaudier-Cabot, Université de Pau et des Pays de l'Adour, France

#### Networks and Communications

Guy Pujolle, LIP6, Sorbonne Université, France

#### Systems and Industrial Engineering

Jean-Paul Bourrières, IMS, Université de Bordeaux, France

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## Chemical Engineering

*Field Director*

**Jean-Claude Charpentier**

Jean-Claude Charpentier, LRGP, ENSIC, Université de Lorraine, France  
jean-claude.charpentier@univ-lorraine.fr

### *Subjects and Subject Heads*

#### **Bioprocesses**

*Gilles Dussap, Université Clermont Auvergne, France – c-gilles.dussap@uca.fr*

*Francesc Godia, Universitat Autònoma de Barcelona, Espagne – Francesc.Godia@uab.es*

#### **Industrial Ecology**

*Ludovic Montastruc, Laboratoire de Génie Chimique de Toulouse, France – ludovic.montastruc@ensiacet.fr*

#### **Innovation and Design in Chemical Engineering**

*Olivier Potier, ENSIC, Université de Lorraine, France – olivier.potier@univ-lorraine.fr*

*Stéphane Négny ENSIACET, Université de Toulouse, France – stephane.negny@ensiacet.fr*

#### **Multi-scale Approaches in Chemical Engineering**

*Huai-Zhi Li, LRGP, Université de Lorraine, France – Huai-Zhi.Li@univ-lorraine.fr*

#### **Process Intensification**

*Christophe Gourdon, ENSIACET, Université de Toulouse, France – christophe.gourdon@ensiacet.fr*

#### **Product Engineering**

*Véronique Falk, ENSGSI, Université de Lorraine, France – veronique.falk@univ-lorraine.fr*

#### **Unit Operations in Chemical Engineering**

*Khashayar Saleh, Université de Technologie de Compiègne, France – khashayar.saleh@utc.fr*

# SCIENCES



## Energy

*Field Directors*

**Alain Dollet**

Promes-CNRS, France  
alain.dollet@promes.cnrs.fr

**Pascal Brault**

CNRS-GREMI, France  
pascal.brault@univ-orleans.fr

### *Subjects and Subject Heads*

#### Combustion

Sébastien Ducruix, EM2C, CentraleSupélec, France – sebastien.ducruix@centralesupelec.fr

#### Electrical Energy Storage

Laurence Croguennec, CNRS, ICMCB – Laurence.Croguennec@icmcb.cnrs.fr  
Laure Monconduit, Université de Montpellier, France – laure.monconduit@umontpellier.fr

#### Electricity

Didier Mayer, MINES ParisTech, France – didier.mayer@mines-paristech.fr

#### Energy Recovery

Gustavo Ardila, IMEP – LAHC, Grenoble, France – gustavo-adolfo.ardila-rodriguez@grenoble-inp.fr

#### Heat and Cold Storage

Philippe Marty, LITEN, CEA Grenoble, France – philippe.marty@cea.fr

#### Nuclear Energy

Sylvain David, Institut de Physique Nucléaire d'Orsay, France – sdavid@ipno.in2p3.fr

#### Oil and Gas

Isabelle Moretti, Université de Pau et des Pays de l'Adour, isabelle.moretti@univ-pau.fr

#### Physics of Energy and Thermodynamics

Michel Feidt, LEMTA, Université de Lorraine, France – michel.feidt@univ-lorraine.fr

#### Production and Conversion of Hydrogen

Pascal Brault, CNRS-GREMI, France – pascal.brault@univ-orleans.fr

#### Raw Materials and Materials for Energy

Frédéric Schuster, CEA, France – frederic.schuster@cea.fr  
Olivier Vidal, Université Grenoble Alpes, France – olivier.vidal@univ-grenoble-alpes.fr

#### Renewable Energies

Abdelilah Slaoui, ICube – Université de Strasbourg, France – abdelilah.slaoui@unistra.fr

#### Societal Issues of Energy

Viviane Hamon, consultante, vivianehamonconseil@orange.fr  
Marie-Christine Zelem, Université Toulouse Jean Jaurès, France – zelem@univ-tlse2.fr

# SCIENCES



## Image

*Field Director*

**Laure Blanc-Féraud**

Université Côte d'Azur, CNRS, INRIA, I3S, France

Laure.Blancferaud@cnsr.fr

### *Subjects and Subject Heads*

#### 3D Imagery and Geometry

Raphaëlle Chaine, Université Lyon 1, LIRIS CNRS, France – raphaelle.chaine@liris.cnrs.fr

#### Compression, Coding and Protection of Images and Videos

Christine Guillemot, INRIA Rennes, France – christine.guillemot@inria.fr

#### DSP Modeling, Optimization and Algorithms

Jalal Fadili, GREYC - Ensicaen, France – Jalal.Fadili@ensicaen.fr

#### Imagery in Life Sciences

Françoise Peyrin, The European Synchrotron Radiation Facility, France – peyrin@esrf.fr

#### Information Seeking in Images and Videos

Hichem Sahbi, LIP6, Sorbonne Université, France – hichem.sahbi@lip6.fr

#### Remote Sensing imagery

Avik Bhattacharya, Indian Institute of Technology Bombay, Inde – avikb@csre.iitb.ac.in

Emmanuel Trouvé, LISTIC, Université Savoie Mont Blanc – emmanuel.trouve@univ-smb.fr

#### Sensors and Image Processing

Cédric Demonceaux, ImViA, Université Bourgogne Franche-Comté, France

cedric.demonceaux@u-bourgogne.fr



# SCIENCES



## Materials Science

*Field Director*

**Jean-Pierre Chevalier**

CNAM, France

[jean-pierre.chevalier@lecnam.net](mailto:jean-pierre.chevalier@lecnam.net)

### *Subjects and Subject Heads*

Characterization in Material Science

Composite Materials

Philippe Boisse, Université de Lyon, INSA, France – [philippe.boisse@insa-lyon.fr](mailto:philippe.boisse@insa-lyon.fr)

Mechanical Behavior of Materials

Metallic Materials

Jean-Pierre Chevalier, CNAM, France – [jean-pierre.chevalier@lecnam.net](mailto:jean-pierre.chevalier@lecnam.net)

Polymers

*Jean-François Gérard, INSA Lyon – [jean-françois.gerard@insa-lyon.fr](mailto:jean-françois.gerard@insa-lyon.fr)*

Processes in Material Science

# SCIENCES



## Mechanics

*Field Director*

**Gilles Pijaudier-Cabot**

Université de Pau et des Pays de l'Adour, France  
gilles.pijaudier-cabot@univ-pau.fr

### *Subjects and Subject Heads*

#### Biomechanics

Claude Verdier, CNRS, France – [claud.verdier@univ-grenoble-alpes.fr](mailto:claud.verdier@univ-grenoble-alpes.fr)

#### Civil Engineering and Construction

Fabrice Gatuingt, ENS Paris-Saclay, France – [fabrice.gatuingt@ens-paris-saclay.fr](mailto:fabrice.gatuingt@ens-paris-saclay.fr)

#### Fluid Mechanics

Medji Azaiez, Institut Polytechnique de Bordeaux, France – [Mejdi.Azaiez@enscbp.fr](mailto:Mejdi.Azaiez@enscbp.fr)

#### Geomechanics

Cino Viggiani, Université Grenoble Alpes, France – [cino.viggiani@3sr-grenoble.fr](mailto:cino.viggiani@3sr-grenoble.fr)

#### Numerical Methods in Mechanics

Sylvain Drapier, Mines Saint Etienne, France – [drapier@emse.fr](mailto:drapier@emse.fr)

#### Structural and Solid Mechanics

Julien Yvonnet, Université Paris-Est Marne-la-Vallée, France – [julien.yvonnet@u-pem.fr](mailto:julien.yvonnet@u-pem.fr)

# SCIENCES



## Networks and Communications

*Field Director*

**Guy Pujolle**

LIP6, Sorbonne Université, France

Guy.Pujolle@lip6.fr

### *Subjects and Subject Heads*

#### Cloud Networking

*Kamel Haddadou, GANDI, France – khaddadou@gmail.com*

#### Intelligent Networks

*Dominique Gaïti, Université de Technologie de Troyes, France – Dominique.Gaiti@utt.fr*

#### Internet

*Stefano Secci, Sorbonne Université, France – secci@free.fr*

#### Internet of Things

*Nadjib Aitsaadi, ESIEE, France – nadjib.aitaadi@esiee.fr*

#### Mobile and Wireless Networks

*Thi Mai Trang Nguyen, Sorbonne Université, France – Thi-Mai-Trang.Nguyen@lip6.fr*

#### Networks Economy

*Hakima Chaouchi, Télécom SudParis, France – hakima.chaouchi@telecom-sudparis.eu*

#### Network Management and Control

*Francine Krief, Université de Bordeaux, France – francine.krief@u-bordeaux.fr*

#### Network Security

*Rida Khatoun, Télécom ParisTech, France – rida.khatoun@telecom-paristech.fr*

#### Optical Networks

*Tulin Atmaca, Télécom SudParis, France – tulin.atmaca@telecom-sudparis.eu*

#### Telecommunications Networks

*Rami Langar, Université Paris-Est, France – rami.langar@u-pem.fr*

#### Vehicular Networks

*Selma Boumerdassi, CNAM, France – Selma.Boumerdassi@cnam.fr*

# SCIENCES



## Systems and Industrial Engineering

*Field Director*

**Jean-Paul Bourrières**

IMS, Université de Bordeaux, France  
jean-paul.bourrieres@ims-bordeaux.fr

### *Subjects and Subject Heads*

#### Automation, Engineering and Control Systems

Laurent Autrique, Université d'Angers, France – laurent.autrique@univ-angers.fr

#### Automation and Ergonomics in Socio-technical Systems

Frederic Vanderhaegen, Université de Valenciennes, France – Frederic.Vanderhaegen@univ-valenciennes.fr

#### Industrial and Productive Engineering

Emmanuel Caillaud, ICube, Université de Strasbourg, France – emmanuel.caillaud@unistra.fr

#### Logistics and Transport

Nathalie Fabbes-Costes, Université d'Aix-Marseille, France – nathalie.fabbe-costes@univ-amu.fr

#### Reliability, Diagnosis, Safety and Maintenance of Systems

Jean-Marie Flaus, Université Grenoble Alpes, France – Jean-Marie.Flaus@univ-grenoble-alpes.fr

#### Robotics

Nicolas Chaillet, Institut FEMTO-ST, Besançon, France – nicolas.chaillet@femto-st.fr

# SCIENCES



Department  
**Mathematics**

*Fields and Directors*

## Mathematics

Nikolaos Limnios, Université de Technologie de Compiègne, France

## Statistics

Nikolaos Limnios, Université de Technologie de Compiègne, France

Kerrie Mengersen, Queensland University of Technology, Australie

# SCIENCES



## Mathematics

*Field Director*

**Nikolaos Limnios**

Université de Technologie de Compiègne, France  
nikolaos.limnios@utc.fr

### *Subjects and Subject Heads*

#### Algebra and Geometry

Abdenacer Makhoulouf, IRIMAS-département de mathématiques, Université de Haute Alsace, France –  
abdenacer.makhoulouf@uha.fr

#### Analysis, Applied Analysis, Abstract Analysis

#### Control and Control of Systems

#### Differential and Integral Equations, Dynamic Systems

#### Discrete Mathematics

#### Financial Mathematics

Yuliya Mishura, Kyiv National University, Ukraine – yumishura1@gmail.com

#### Inverse Problems

#### Mathematics in Engineering

#### Mathematical Modeling and Methods

#### Numerical Analysis and Scientific Computing

#### Optimization

#### Physics and Mathematical Mechanics

#### Queuing Theory and Applications

Vladimir Anisimov, AMGEN, UK – vladimir.anisimov@amgen.com

#### Stochastic Calculations and Stochastic Differential Equations

#### Stochastic Optimization



# SCIENCES



## Statistics

*Field Directors*

**Nikolaos Limnios**

Université de Technologie de Compiègne, France  
nikolaos.limnios@utc.fr

**Kerrie Mengersen**

Queensland University of Technology, Australie  
k.mengersen@qut.edu.au

### *Subjects and Subject Heads*

Applied Statistics

Biostatistics

Data Science

Gilbert Saporta, CNAM, Paris, France – gilbert.saporta@cnam.fr

Geostatistics

Lifetime and Reliability Statistics

Mathematical Statistics

Statistics and Ecology

Nathalie Peyrard, MIAT, INRA Toulouse, France – nathalie.peyrard@inra.fr

Stochastic Process Statistics

Benoîte de Saporta, Université de Montpellier, France – benoite.de-saporta@umontpellier.fr

# SCIENCES



## Department **Physics**

### *Fields and Directors*

#### Electronics Engineering

Francis Balestra, Grenoble-INP, France

#### Nanoscience and Nanotechnologies

Jean Chazelas, Thales, France

Charlotte Tripon-Canseliet, ESPCI, France

#### Physics of Condensed Matter

Philippe Goudeau, Institut Pprime, France

#### Physics of Soft Matter

Françoise Brochard-Wyart, Sorbonne Université et Institut Curie, France

#### Waves

Pierre-Noël Favennec, ArmorScience, France

Frédérique de Fornel, CNRS, Université de Bourgogne, France

# SCIENCES



## Electronics Engineering

*Field Director*

**Francis Balestra**

Grenoble-INP, France

francis.balestra@imep.grenoble-inp.fr

### *Subjects and Subject Heads*

Components and Manufacturing Techniques

Francis Balestra, Grenoble-INP, France – francis.balestra@imep.grenoble-inp.fr

Design Methodologies and Architectures

Ahmed Jerraya, CEA-LETI Grenoble, France – ahmed.jerraya@cea.fr

Imaging Devices

# SCIENCES



## Nanoscience and Nanotechnologies

*Field Directors*

**Jean Chazelas**

Thales, France

[jean.chazelas@fr.thalesgroup.com](mailto:jean.chazelas@fr.thalesgroup.com)

**Charlotte Tripon-Canseliet**

ESPCI, France

[charlotte.tripon-canseliet@espci.fr](mailto:charlotte.tripon-canseliet@espci.fr)

### *Subjects and Subject Heads*

Nano-electronics

Nano-energy

Nano-printing

Nanobiology and Health

Nanomaterials and Nanotechnologies

Nanophotonics

Nanotechnologies

# SCIENCES



## Physics of Condensed Matter

*Field Director*

**Philippe Goudeau**

Institut Pprime, France

[philippe.goudeau@cnrs.pprime.fr](mailto:philippe.goudeau@cnrs.pprime.fr)

### *Subjects and Subject Heads*

Cultural and Industrial Heritage Materials

Philippe Sciau, CEMES-CNRS, France – [philippe.sciau@cemes.fr](mailto:philippe.sciau@cemes.fr)

Condensed Matter under Extreme Conditions

Divided Media, Heterogeneous Media, Interfaces

Roland Pellenq, CNRS – Massachusetts Institute of Technology, USA – [pellenq@mit.edu](mailto:pellenq@mit.edu)

Instrumentation, Experimental Techniques, Large-scale Facilities

Amina Taleb-Ibrahimi, Synchrotron SOLEIL, France – [amina.taleb@synchrotron-soleil.fr](mailto:amina.taleb@synchrotron-soleil.fr)

Magnetism and Nanomagnetism, Spintronics

Eric Vincent, CEA Saclay, France – [eric.vincent@cea.fr](mailto:eric.vincent@cea.fr)

Physics of Living Matter

François Gallet, MSC, Université Paris-Diderot, France – [francois.gallet@univ-paris-diderot.fr](mailto:francois.gallet@univ-paris-diderot.fr)

Structures, Phase Transitions, Defects, Disorder

Surfaces, Growth, Selforganization, Heterostructures and Nanoobjects; local probes

# SCIENCES



## Physics of Soft Matter

*Field Director*

**Françoise Brochard-Wyart**

Sorbonne Université et Institut Curie, France  
brochard@curie.fr

### *Subjects and Subject Heads*

#### Active Soft Material

*Jon Otto Fossum, Norwegian University of Science and Technology, Norvège – jon.fossum@ntnu.no*

#### Colloids – Surfactants – Formulation

*Paul Dommersnes, Norwegian University of Science and Technology, Norvège – paul.dommersnes@ntnu.no*

#### Lyotropic and Thermotropic Liquid Crystals

*Pawel Pieranski, Université Paris-Sud, France – pawel.pieranski@u-psud.fr*

*Maria Helena Godinho, New University of Lisbon, Portugal – mhg@fct.unl.pt*

#### Physics of Hybrid Membranes: Lipids, Polymers, Proteins

*Olivier Sandre, Laboratoire de Chimie des Polymères Organiques - LCPO Bordeaux, olivier.sandre@enscbp.fr*

#### Physics of the living cell and tissues - organoids

*Pierre Nassoy, Université de Bordeaux, France – pierre.nassoy@u-bordeaux.fr*

#### Plant Physics

*Xavier Noblin, Université Nice Sophia Antipolis, France – xavier.noblin@unice.fr*

#### Polymer Physics - adhesion - friction

*Liliane Leger, Université Paris-Sud-Paris Saclay, France – liliane.leger@u-psud.fr*

#### Reactive Soft Matter - Capillarity - Dampening

*Damien Baigl, École normale supérieure, Paris, France – damien.baigl@ens.fr*

# SCIENCES



## Waves

*Field Directors*

**Pierre-Noël Favennec**

ArmorScience, France  
pierre-noel.favennec@wanadoo.fr

**Frédérique de Fornel**

CNRS, Université de Bourgogne, France  
ffornel@u-bourgogne.fr

### *Subjects and Subject Heads*

#### Acoustics and Sound

*Michel Bruneau, Université du Maine – michel.bruneau@univ-lemans.fr*  
*Pascal Picart, ENSIM Le Mans, France – Pascal.Picart@univ-lemans.fr*

#### Electromagnetism

Pierre-Noël Favennec, ArmorScience, France – pierre-noel.favennec@wanadoo.fr

#### Environmental Effects of Waves and Electromagnetic Compatibility

*Philippe Levêque, BioEM, XLIM, France – philippe.leveque@xlim.fr*

#### Instrumentation, Sensors and Measurements

Cyril Lupi, Université de Nantes, France – Cyril.Lupi@univ-nantes.fr

#### Ionosphere and Radio

#### Photonics, Optics and Lasers

Pascal Besnard, FOTON, Enssat, France – pascal.besnard@enssat.fr

#### Radiofrequency and Radio Technology

#### Space and Ground Radioastronomy

Philippe Zarka, Observatoire de Paris, France – Philippe.Zarka@obspm.fr

#### Spectrum and Frequency Management

#### Waves and Communications

#### Waves and Energy

*Smail Tedjini, Grenoble-INP, France – Smail.Tedjini@lcis.grenoble-inp.fr*

# SCIENCES



## Department Social Sciences and Humanities

### *Fields and Directors*

Architecture, Urban Planning and Development

Patrizia Laudati, DeVISu, Université Polytechnique Hauts-de-France, France

Cognition and Language

Patrice Bellot, Aix-Marseille Université - CNRS, France

Economic Science

Jacques Le Cacheux, Université de Pau et des Pays de l'Adour, France

Education and Training

Jean-Marc Labat, LIP6, Sorbonne Université, France

Geography and Demography

Denise Pumain, Université Paris 1 Panthéon-Sorbonne, France

History of Sciences

Jean-Claude Dupont, Université de Picardie Jules Verne, France

Innovation Management

Thierry Rayna, Ecole Polytechnique, France

Management and Enterprises

Régine Teulier, Ecole Polytechnique, France

Sociology, Ethics and Epistemology of Sciences

Bernard Reber, CNRS–SciencesPo, France

Jim Dratwa, Commission européenne, Bruxelles, Belgique



# SCIENCES



## Architecture, Urban Planning and Development

*Field Director*

**Patrizia Laudati**

DeViSu, Université Polytechnique Hauts-de-France, France

patrizia.laudati@uphf.fr

### *Subjects and Subject Heads*

#### Architecture and Society

Jean-Pierre Frey, École d'Urbanisme de Paris, Université Paris Est Créteil, France

#### Design in Architecture

Elizabeth Mortamais, EVCAU ENSA Paris-Val de Seine, France – emortamais@gmail.com

#### Digital Heritages

Sylvie Leleu-Merviel, DeViSu – Université Polytechnique Hauts-de-France, France  
sylvie.merviel@univ-valenciennes.fr

#### Integrated Urban Environment Management and Resilience

Marc-André Mequignon, Université de Toulouse 3, France – marc-andre.mequignon@iut-tlse3.fr  
Jean-Pierre Mignot, Université de Toulouse 3, France – jean-pierre.mignot@iut-tlse3.fr

#### Interior Design and Ergonomics

#### Languages, Symbolic and Representation Techniques in Architecture

#### Space, Mobility and Infrastructures

Laurent Teresi, Université de Toulouse 3, France – laurent.teresi@iut-tlse3.fr  
Sébastien Jambort, Université de Toulouse 3, France – sebastien.jambort@iut-tlse3.fr

#### Technological Breakthroughs in Architecture

Hafida Boulekbache, Université Polytechnique Hauts-de-France, France  
hafida.boulekbache@univ-valenciennes.fr

#### Territorial Intelligence and Urban Development

Isam Shahrour, Université de Lille 1, France – isam.shahrour@univ-lille1.fr

#### Tools for Territorial Planning and Representation

Vincent Becue, Université de Mons, Belgique – vincent.becue@umons.ac.be

#### Urban Art

Anne Beyaert-Geslin, MICA, Université Bordeaux-Montaigne, France  
anne.geslin-beyaert@u-bordeaux-montaigne.fr

#### Urban Planning

# SCIENCES



## Cognition and Language

*Field Director*

**Patrice Bellot**

Aix-Marseille Université - CNRS, France

[patrice.bellot@lis-lab.fr](mailto:patrice.bellot@lis-lab.fr)

### *Subjects and Subject Heads*

Decision and Cognition

Epistemology of Cognitive Sciences

*Jérôme Sackur, EHESS et Ecole Polytechnique – [jerome.sackur@gmail.com](mailto:jerome.sackur@gmail.com)*

Intelligence

Language, Cognition and Culture

*François Rastier, CNRS – [frastier@gmail.com](mailto:frastier@gmail.com)*

Languages and Automatic Language Processing

*Jean-Luc Minel, Université Paris Ouest Nanterre La Défense, France – [jean-luc.minel@u-paris10.fr](mailto:jean-luc.minel@u-paris10.fr)*

Memory, Attention and Learning

Perception, Affects and Emotions

*Magalie Ochs, Aix-Marseille Université CNRS – [magalie.ochs@lis-lab.fr](mailto:magalie.ochs@lis-lab.fr)*

# SCIENCES



## Economic Science

*Field Director*

**Jacques Le Cacheux**

Université de Pau et des Pays de l'Adour, France  
jacques.lecacheux@univ-pau.fr

### *Subjects and Subject Heads*

Agents and Behaviors  
Economic History  
Economic Policies  
Geographical Economy  
Goods  
Growth and Cycles  
Information Imperfections  
International Relations  
Institutional Context  
Market Failures: Externalities and Collective Goods  
Market Structures: Competition and Its Limits  
Monetary, Banking And Financial Economy  
Sectorial Economies  
Short-term Macroeconomic Balance  
Trade of Goods

# SCIENCES



## Education and Training

*Field Director*

**Jean-Marc Labat**

LIP6, Sorbonne Université, France

Jean-Marc.Labat@lip6.fr

### *Subjects and Subject Heads*

#### Cognition and Learning Processes

*Emmanuel Sander, Université de Genève, Suisse – emmanuel.sander@unige.ch*

#### Didactics

*Cécile de Hosson, LDAR - Université Paris-Diderot, France – cecile.dehosson@univ-paris-diderot.fr*

#### Digital Education

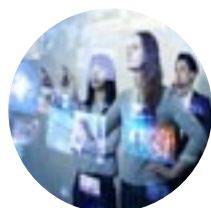
*Sébastien George, Le Mans Université, France – Sebastien.George@univ-lemans.fr*

#### Education and Society

*Géraldine Farges, Université de Bourgogne, France – geraldine.farges@u-bourgogne.fr*

*Xavier Pons, Université Paris-Est Créteil, France – ponsx@wanadoo.fr*

# SCIENCES



## Geography and Demography

*Field Director*

**Denise Pumain**

Université Paris 1 Panthéon-Sorbonne, France  
pumain@parisgeo.cnrs.fr

### *Subjects and Subject Heads*

#### The World in its Divisions: Borders and Discontinuities

Clarisse Didelon, Université Paris I, France – Clarisse.Didelon-Loiseau@univ-paris1.fr

#### Physical Geography, Construction of Environments and Landscapes

Etienne Cossart, Université de Lyon3, France – etienne.cossart@univ-lyon3.fr

#### The World Urbanization

Eric Denis, CNRS, France – eric.denis@parisgeo.cnrs.fr

#### Rural Geography

Pierre Pistre, Université Paris Diderot - Géographie-cités, France – pierre.pistre@parisgeo.cnrs.fr

#### Geography and Complex System Models

Marion Le Texier, Université de Rouen, France – marion.le-texier@univ-rouen.fr

#### Locations of Industries, Businesses and Services

Bernadette Merenne, Université de Liège, Belgique – b.merenne@uliege.be

#### Socio-Economic Geography of the Fabric of Cities

Natacha Aveline-Dubach, CNRS, France – natacha.aveline@cnrs.fr

#### Geography of Inequality

Clémentine Cottineau, CNRS, France – clementine.cottineau@gmail.com

#### Infrastructure and Mobility Networks Geography

Hadrien Commenges, Université Paris I, France – hadrien.commenges@univ-paris1.fr

Florent Le Néchet, Université de Paris Est Marne la Vallée, France – Florent.Lenechet@univ-mlv.fr

#### Fractal Logics in Geography – Hierarchies and Centralities

Cécile Tannier, CNRS – Université Bourgogne Franche-Comté, France – cecile.tannier@univ-fcomte.fr

#### Political Geography

Frédéric Giraut, Université de Genève, Suisse – Frederic.Giraut@unige.ch

#### Geography of Risks

Samuel Rufat, Université de Cergy- Pontoise, France – samuel.rufat@u-cergy.fr

#### Cartography

Colette Cauvin, Université de Strasbourg, France – miradou@geocarto.eu

#### Demography

Brigitte Baccaïni, Commissariat général à l'égalité des territoires, France – brigitte.baccaini@cget.gouv.fr

# SCIENCES



## History of Sciences

*Field Director*

**Jean-Claude Dupont**

Université de Picardie Jules Verne, France

[jcd789@icloud.com](mailto:jcd789@icloud.com)

### *Subjects and Subject Heads*

#### Astronomy, Physics, Chemistry and Earth Sciences

*Christian Bracco, Université Côte d'Azur et Observatoire de Paris – [christian.bracco@obspm.fr](mailto:christian.bracco@obspm.fr)*

#### Humanities and Social Sciences

*Alexandre Escudier, CEVIPOF, Sciences Po, Paris – [alexandre.escudier@sciencespo.fr](mailto:alexandre.escudier@sciencespo.fr)*

#### Issues, General Themes and Methods of the History of Science

*Stéphane Tirard, Université de Nantes – [Stephane.Tirard@univ-nantes.fr](mailto:Stephane.Tirard@univ-nantes.fr)*

#### Life Sciences

*Jean-Claude Dupont, Université de Picardie Jules Verne – [jcd789@icloud.com](mailto:jcd789@icloud.com)*

#### Logic and Mathematics

*Sabine Rommevaux-Tani, CNRS, Laboratoire SPHERE – [sabine.rommevaux@free.fr](mailto:sabine.rommevaux@free.fr)*

# SCIENCES



## Innovation Management

*Field Director*

**Thierry Rayna**

Ecole Polytechnique, France  
thierry.rayna@polytechnique.edu

### *Subjects and Subject Heads*

#### Financing innovation

Benjamin Le Pendeven, Audencia Business School, France – [blependeven@audencia.com](mailto:blependeven@audencia.com)

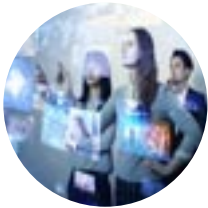
#### Knowledge Management in Innovation

Aurore Haas, Skema Business School, France – [aurore.haas@skema.edu](mailto:aurore.haas@skema.edu)

#### Open and User Innovation

Ludmila Striukova, Skema Business School, France – [ludmila.striukova,@skema.edu](mailto:ludmila.striukova,@skema.edu)

# SCIENCES



## Management and Enterprises

*Field Director*

**Régine Teulier**

i3-CRG, Institut Polytechnique de Paris, France  
regine.teulier@polytechnique.edu

### *Subjects and Subject Heads*

Brand Marketing

Management and Innovation in the Cultural Sector

Management and Innovation in the Health Sector

Corinne Grenier, KEDGE Business School Marseille, France – corinne.grenier@kedgebs.com

SAP – Strategy As Practice

Services Management

Marianne Abramovici, IAE, Université Paris-Est Marne-la-Vallée, France – marianne.abramovici@u-pem.fr

Skills and Human Ressources

Patrick Gilbert, IAE de Paris, Université de Paris 1 Panthéon-Sorbonne, France – gilbert.iae@univ-paris1.fr



# SCIENCES



## **Sociology, Ethics and Epistemology of Sciences**

*Field Directors*

**Bernard Reber**

CNRS–SciencesPo, France  
bernard.reber@sciencespo.fr

**Jim Dratwa**

Commission européenne, Bruxelles, Belgique  
jim.dratwa@gmail.com

### *Subjects and Subject Heads*

Digital Ethics and Ethics of Computing, Robots and Artificial Intelligence

Ethics of Environment and Energy

Epistemology of Biology, Medical and Cognitive Science

Epistemology of Computer Science, Logic, Mathematics, Modeling and Complex Systemes

Epistemology of Normative Sciences

Epistemology of Physics, Chemistry and Earth Sciences

Epistemology of Sociology

General Epistemology

# SCIENCES



Department  
**Earth and Universe**

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*Fields and Directors*

Climate and Atmosphere

Denis-Didier Rousseau, Ecole Normale Supérieure, France

Geoscience

Yves Lagabrielle, Université de Rennes 1, France

Oceanography and Marine Ecology

François Lallier, Sorbonne Université, France

Space Exploration and Technology

Jean-Luc Lefebvre, consultant, France

Universe

Fabienne Casoli, Observatoire de Paris, France

# SCIENCES



## Climate and Atmosphere

*Field Director*

**Denis-Didier Rousseau**

Ecole Normale Supérieure, France  
denis-didier.rousseau@lmd.ens.fr

### *Subjects and Subject Heads*

#### Atmospheric Dynamics

Caroline Muller, Laboratoire de Météorologie Dynamique – muller@lmd.ens.fr

#### Atmospheric Physico-Chemistry

Benoit Laurent, LISA, Université Paris Diderot – Benoit.Laurent@lisa.u-pec.fr

#### Climate and Anthropocene

Venance Journé, Laboratoire de Météorologie Dynamique – venance.journe@lmd.jussieu.fr

#### Climate and Water

#### Climate Change Impacts

#### Climate Models

Fabio d'Andrea, Ecole Normale Supérieure, France – dandrea@lmd.ens.fr

Hervé Le Treut, LMD, Sorbonne Université – Letreut@lmd.ens.fr

#### Paleoclimate

Denis-Didier Rousseau, Ecole Normale Supérieure, France – denis-didier.rousseau@lmd.ens.fr

#### Planetary Atmospheres

Aymeric Spiga, Laboratoire de Météorologie Dynamique – spiga@lmd.jussieu.fr

# SCIENCES



## Geoscience

*Field Director*

**Yves Lagabrielle**

Université de Rennes 1, France  
yves.lagabrielle@univ-rennes1.fr

### *Subjects and Subject Heads*

#### The Earth: Origin and Early Ages

*Jean-Alix Barrat, Université de Bretagne Occidentale, France – jean-alix.barrat@univ-brest.fr*

#### Structure and Dynamics of the Earth's Interior

##### Lithosphere-Asthenosphere Interactions

René Maury, Université de Brest, France – rene.maury@univ-brest.fr

##### Kinematics and Dynamics of the Oceanic Lithosphere

Serge Lallemand, CNRS, Université de Montpellier, France – serge.lallemand@gm.univ-montp2.fr

##### Dynamics of the Continental Lithosphere

Sylvie Leroy, Sorbonne Université, CNRS-INSU, ISTE P, France – sylvie.leroy@upmc.fr

##### The Surface of the Lithosphere and the Biosphere

François Baudin, Sorbonne Université, ISTE P, France – francois.baudin@sorbonne-universite.fr

##### Natural Resources: Applied Basic Research

Philippe Boulvais, Université de Rennes 1, France – philippe.boulvais@univ-rennes1.fr

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## Oceanography and Marine Ecology

*Field Director*

**François Lallier**

Sorbonne Université, France

[lallier@sb-roscoff.fr](mailto:lallier@sb-roscoff.fr)

### *Subjects and Subject Heads*

The Coastal Ocean, above the Continental Shelf

The Coastal Ocean, the Interface between Land and Sea

*Dominique Davoult, Sorbonne Université, France – [davoult@sb-roscoff.fr](mailto:davoult@sb-roscoff.fr)*

The Deep Ocean: Terra almost Incognita

*François Lallier, Sorbonne Université, France – [lallier@sb-roscoff.fr](mailto:lallier@sb-roscoff.fr)*

The Deep Pelagic Ocean, a Black Box

The Pelagic Seal Ocean, the Planet's Lung

# SCIENCES



## Space Exploration and Technology

*Field Director*

**Jean-Luc Lefebvre**

consultant, France

[jl.lefebvre@aist.enst.fr](mailto:jl.lefebvre@aist.enst.fr)

### *Subjects and Subject Heads*

#### Astronautics and Space Engineering

*Michel Bousquet, ISAE, France – [michel.bousquet@isae-supaero.fr](mailto:michel.bousquet@isae-supaero.fr)*

#### Space and Earth

*Jean-Pierre Madier, consultant, France – [jpierre.madier@gmail.com](mailto:jpierre.madier@gmail.com)*

#### Space and Humankind

*Jean-Luc Lefebvre, consultant, France – [jl.lefebvre@aist.enst.fr](mailto:jl.lefebvre@aist.enst.fr)*

*Jean-Pierre Madier, consultant, France – [jpierre.madier@gmail.com](mailto:jpierre.madier@gmail.com)*

#### Space Environments

*Florent Deleflie, Observatoire de Paris, France – [florent.deleflie@obspm.fr](mailto:florent.deleflie@obspm.fr)*

# SCIENCES



## Universe

*Field Director*

**Fabienne Casoli**

Observatoire de Paris, France

[fabienne.casoli@obspm.fr](mailto:fabienne.casoli@obspm.fr)

### *Subjects and Subject Heads*

#### Cosmology and General Relativity

Alain Blanchard, IRAP, Université de Toulouse, France – [alain.blanchard@irap.omp.eu](mailto:alain.blanchard@irap.omp.eu)

#### Galaxies

Françoise Combes, Observatoire de Paris et Collège de France, France – [francoise.combes@obspm.fr](mailto:francoise.combes@obspm.fr)

#### Solar System

Thérèse Encrenaz, Observatoire de Paris, France – [therese.encrenaz@obspm.fr](mailto:therese.encrenaz@obspm.fr)

#### Sun and Stars

Corinne Charbonnel, Université de Genève, Suisse & CNRS, IRAP, France – [Corinne.Charbonnel@unige.ch](mailto:Corinne.Charbonnel@unige.ch)