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Sciences, Philosophie, Histoire
UMR 7219

**COLLOQUE
INTERNATIONAL**

MEASUREMENT AT THE CROSSROADS

HISTORY, PHILOSOPHY AND SOCIOLOGY OF MEASUREMENT

27 > 29 JUNE 2018

ENSA Paris-Val de Seine | Amphithéâtre 310
3 quai Panhard et Levassor | Paris 13^e

ROUND TABLE
TOWARDS A NEW INTERNATIONAL SYSTEM OF UNITS
27 JUNE | 17h > 18h30

KEYNOTE SPEAKERS

Karine Chemla | CNRS, SPHERE, France
Wendy Parker | Durham University, United Kingdom
Oliver Schaudt | Heidelberg University, Germany
Eran Tal | McGill University, Canada

ORGANIZERS

Nadine de Courtenay | University Paris Diderot, SPHERE, France
Fabien Grégis | Tel Aviv University, Israel & SPHERE, France
Christine Proust | CNRS & University Paris Diderot, SPHERE, France

website | <https://measurement2018.sciencesconf.org/>
contact | measurement2018@sciencesconf.org

PARIS VAL DE SEINE
UNIVERSITÉ



univ-paris-diderot.fr

Measurement at the Crossroads is the third interdisciplinary conference to explore the history and philosophy of measurement after *Dimensions of Measurement* in Bielefeld (2013) and *The Making of Measurement* in Cambridge (2015). The conference will bring together historians, philosophers, and sociologists of science to address questions related to measurement across disciplines ranging from the natural sciences to the life and human sciences.

The recent revival of the philosophy of measurement in the early 2000s appears to be instrumental in overcoming the tensions that obstructed science studies during much of the second half of the twentieth century. The Paris conference aspires to promote the new ways of addressing issues of quantification and measurement that are now emerging and promising to bridge the various gulfs – theoretical versus practical, descriptive versus normative – that have divided the philosophical, historical and sociological approaches to science. It is now recognized that questions of quantification transcend the earlier focus on meaning and representation which formerly attracted the attention of philosophers of science, and that these questions benefit from investigation alongside the means and processes that enable scientists, and human agents in general, to agree on their measurement results and make them reliable bases for decision and action. The resulting shift of attention towards the uses of measurement results in inference and prediction places the new agenda of philosophy of measurement at the crossroads of conceptual, epistemic, historical, material, technological and institutional issues.

The 2018 conference comes at a time when the field of metrology is about to reach an important turning point with the reform of the International System of Units (SI) that is to be announced by the end of 2018. *With Measurement at the Crossroads* we aspire to connect the discussions developing in the emerging field of history and philosophy of measurement with some of the issues arising from this major reshaping of the field of metrology. Special attention will thus be given to issues pertaining to the formation of systems of units and standards, as well as to related institutional matters. The conference will build upon the two former ones by inscribing these issues more explicitly in a world-wide and a long-term perspective. In addition to the enquiries related to the contemporary SI reform, time will therefore be allotted for studies concerned with how measurement units have been worked out in the past, from Antiquity to today's reform, in different regions of the world. This will offer a cultural-anthropological outlook on metrology.



Programme committee

- Mieke Boon (University of Twente, Netherlands)
- Marcel Boumans (Utrecht University, Netherlands)
- Thomas Coudreau (University Paris Diderot, France)
- Olivier Darrigol (CNRS, SPHERE, France)
- Noël Dimarcq (CNRS, Observatoire de Paris, France)
- Marie Gaille (CNRS, SPHERE, France)
- Giora Hon (University of Haifa, Israel)
- Matthieu Husson (CNRS, Observatoire de Paris, France)
- Shaul Katzir (Tel Aviv University, Israel)
- Alain Leplège (University Paris Diderot, France)
- Alexandre Mallard (Mines ParisTech, France)
- Luca Mari (University Cattaneo, Italy)
- Alfred Nordmann (Technical University of Darmstadt, Germany)
- Theodore Porter (University of California, Los Angeles, USA)
- Léna Soler (University of Lorraine, France)
- John Steele (Brown University, USA)
- Mark Wilson (University of California, Berkeley, USA)

Organizing committee

- Thomas Coudreau (University Paris Diderot, France)
- Nadine de Courtenay (University Paris Diderot, France)
- Patrice Delon (SPHERE, University Paris Diderot, France)
- Justin Gabriel (SPHERE, University Paris Diderot, France)
- Fabien Grégis (Tel Aviv University & SPHERE)
- Sarah Hijmans (University Paris Diderot, France)
- Jan Lacki (University of Geneva)
- Christine Mousset (University Paris Diderot, France)
- Christine Proust (CNRS, SPHERE, France)
- Youna Tonnerre (University Rennes 1 & University Paris Diderot, France)

Organizers

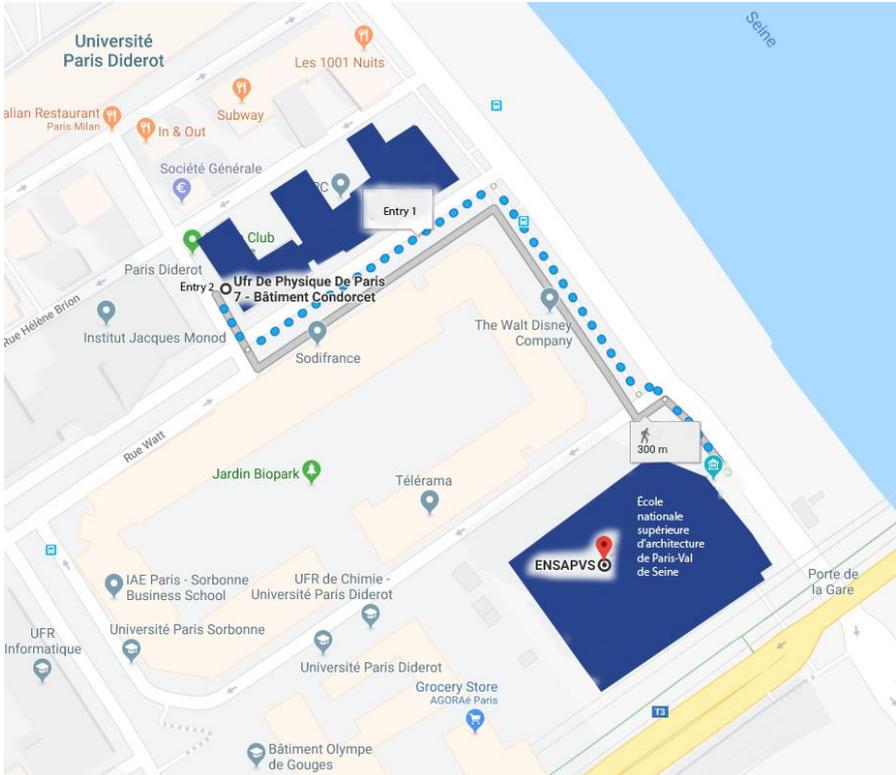
- Nadine de Courtenay (University Paris Diderot, France)
- Fabien Grégis (Tel Aviv University & SPHERE)
- Christine Proust (CNRS, SPHERE, France)

Support

- Poster: Sandra Cochin
- Booklets: David Feltz
- Logo: Laurane Travagli-Chanal

Programme

Conference Venue



École nationale supérieure d'architecture de Paris-Val de Seine (ENSAPVS) Amphitheatre 310

3-15 Quai Panhard et Levassor, 75013 Paris

University Paris Diderot, Condorcet building

Luc Valentin 454A / **Malevitch 483A** / **Mondrian 646A**

Entry 1 : 10 rue Alice Domon et Léonie Duquet, 75013 Paris

Entry 2 : 4 rue Elsa Morante, 75013 Paris

- **WIFI Condorcet:** Individual access only for registered participants
- **WIFI ENSA PVS:** Information at the end of this booklet
- **Phone contact in case of emergency:**
 - Justin Gabriel: +33 (0)6 76 21 48 93
 - Christine Proust: +33 (0)6 79 13 69 82

Programme overview

	Wednesday 27	Thursday 28	Friday 29
08:15			
08:45	Welcoming coffee*		
09:00	Introduction*		
09:30	Keynote lecture 1* Eran TAL	Keynote lecture 2* Wendy PARKER	Parallel sessions (E)** Panels 14/15/16
10:00			
10:30	Coffee break*	Coffee break*	
11:00			Coffee break*
11:30	Parallel sessions (A)** Panels 1/2/3	Parallel sessions (C) Panel 7*	Keynote lecture 4* Oliver SCHLAUDT
12:00		Panels 8/9/10**	
12:30			
13:00			
13:30	Lunch break Restaurant	Lunch break - buffet*	
14:00			
14:30			
15:00	Parallel sessions (B)** Panels 4/5/6	Parallel sessions (D) Panel 11* (starts at 14:00)	
15:30		Panels 12/13**	
16:00			
16:30	Coffee break	Coffee break	
17:00			
17:30	Roundtable* Towards a New International System of Units	Keynote lecture 3* Karine CHEMLA	
18:00			
18:30			
19:00	Cocktail reception*		
19:30			
20:00			
21:00		Conference dinner	

* Paris National School of Architecture Val de Seine, ENSA PVS (amphitheatre 310)

** Condorcet building (Valentin 454A, Malevitch 483A and Mondrian 646A)

Wednesday 27

08:15 – 08:45 Welcoming coffee and registration

Amphitheatre 310 (Ecole Nationale Supérieure d'Architecture, ENSA PVS)

08:45 – 09:00 Introduction Amphitheatre 310 (ENSA PVS)

Nadine de Courtenay, Fabien Grégis, Christine Proust & the organizing committee

09:00 – 10:30

Amphitheatre 310
(ENSA PVS)

Keynote lecture 1

Chair: Fabien Grégis (Tel Aviv University)

Eran Tal (McGill University)

Measurement, Prediction and Coherence

10:30-11:00 Coffee break Amphitheatre 310 (ENSA PVS)

Panel 1 (symposium)

Computation and Measurement
at the Large Hadron Collider:
Managing complexity in high
energy physics experiments

Chair: Thomas Coudreau
(University Paris Diderot)

Panel 2

Historical foundations of the
philosophy of measurement

Chair: Nadine de Courtenay
(University Paris Diderot)

Panel 3

Standardization at issue

Chair: Youna Tonnerre
(University Rennes 1 &
University Paris Diderot)

11:00 Luc Valentin 454A

Sophie Ritson

(Alpen-Adria Universität Klagenfurt)
Measurement and machine learning
at the Large Hadron Collider (LHC):
the Higgs selfcoupling as a case study

Malevitch 483A

Michael Heidelberger

(Eberhard Karls
Universität Tübingen)
Ernst Mach's theory
of measurement

Mondrian 646A

Aashish Velkar

(University of Manchester)
The Cultural and economic
consequences of global
metrological standardisation

11:40 Luc Valentin 454A

Florian Boge

(Bergische Universität Wuppertal)
How to infer from simulated
measurements?

Malevitch 483A

Francesca Biagioli

(University of Vienna)
Hermann von Helmholtz and
the quantification
problem of psychophysics

Mondrian 646A

Rebecca Jackson

(Indiana University)
"The Uncertain method of
drops": How a non-uniform
fluid unit survived
the century of standardization

12:20 Luc Valentin 454A

Paul Grünke

(Karlsruher Institut für Technologie)
The epistemic status of
experimental measurements
involving computer simulations

Malevitch 483A

Pablo Acuña

(Pontificia Universidad
Católica de Valparaíso)
Measuring the
Epistemology of Geometry

Mondrian 646A

Edward Gillin

(University of Cambridge)
Mathematicians, musicians, and
the measurement of musical
pitch in mid-Victorian Britain

13:00-14:30: Lunch break – Restaurant

Wednesday 27

Panel 4

Measurement, Intersubjectivity, and trust

Chair: Fabien Grégis (Tel Aviv University)

14:30 Luc Valentin 454A

Andrew Maul (University of California, Santa Barbara), **Mark Wilson** (University of California, Berkeley), **Luca Mari** (Università Cattaneo)
Intersubjectivity of measurement across the sciences:
Unit definition and dissemination

Panel 5

Revisiting the coordination problem

Chair: Francesca Biagioli (University of Vienna)

Malevitch 483A

Rick Shang (Washington University, St Louis)
Does the coordination problem exist:
Measurement in neuroimaging

Panel 6

Measurement, social norms, and public health policies

Chair: Claude-Olivier Doron (University Paris Diderot)

Mondrian 646A

Moran Levy & **Gil Eyal** (Columbia University)
Politicizing imprecision

15:10 Luc Valentin 454A

Rafael Lattanzi Vaz (National Institute of Metrology, Quality and Technology, Brazil)
Metrological traceability and the bridge between reliability and trust

Malevitch 483A

Tzur Karelitz (National Institute for Testing and Evaluation)
Thomas Judd (United States Military Academy)
Charles Secolsky (Rockland Community College)
The Evolution of face validity from inception to reinstatement

Mondrian 646A

Marion Boulicault (Massachusetts Institute of Technology)
Gender and the measurement of fertility: a case study in critical metrology

15:50 Luc Valentin 454A

Florence Hsia (University of Wisconsin-Madison)
Measuring a Chinese eclipse

Malevitch 483A

William Fisher (University of California, Berkeley)
Blending objectivity and subjectivity in measurement: Benjamin Wright's personal approach to learning

Mondrian 646A

Nicolas Rasmussen (University of New South Wales, Sydney)
Measuring fatness and its hazards: Precision adipometry versus a 1950s public health campaign against obesity

16:30-17:00: Coffee break Amphitheatre 310 (ENSA PVS)

17:00 – 18:30
Amphitheatre 310
(ENSA PVS)

Roundtable: Towards a New International System of Units

Chair: Thomas Coudreau (University Paris Diderot)

- **Christian Bordé** (Académie des sciences, CNRS)
- **Richard Davis** (International Bureau of Weights and Measures)
- **Marc Himbert** (Conservatoire National des Arts et Métiers)
- **Estefania de Mirandés** (International Bureau of Weights and Measures)
- **François Piquemal** (Laboratoire National de Métrologie et d'Essais)
- **Eran Tal** (McGill University)

18:30-20:00 Cocktail reception Amphitheatre 310 (ENSA PVS), cafeteria

Thursday 28

09:00 – 10:30

Amphitheatre 310
(ENSA PVS)

Keynote lecture 2

Chair: Nadine de Courtenay (University Paris Diderot)

Wendy Parker (Durham University): Measuring via computer simulation?

10:30-11:00 Coffee break Amphitheatre 310 (ENSA PVS)

Panel 7

Investigating models of social measurement

Chair: Alain Lépître
(University Paris Diderot)

Panel 8

The Making of instruments and standards of measurement

Chair: Jan Lacki
(University of Geneva)

Panel 9

Managing data: Three studies

Chair: Sarah Hijmans
(University Paris Diderot)

Panel 10

Measurement practices: from state regulation to mathematical guidance

Chair: Christine Proust
(CNRS, SPHERE)

11:00 Amphitheatre 310 (ENSA)

Luc Valentin 454A

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Leslie Pendril
Jeanette Melin

(Research institutes of Sweden, Metrology)

Stefan Cano

(Modus Outcomes)

Restitution of ability and difficulty from decision making: the metrology of human-based perceptions

Ariane Fillmer

(Physikalisch-Technische Bundesanstalt)

Theresa Köbe

(Charité - University Medicine Berlin)

Liqun Zhou

(Beijing Foreign Studies University & Needham Research Institute, Cambridge)

A DIY water clock (clepsydra) from a Chinese text of Yuan dynasty

Chris Partridge
Sergio De Cesare

David Leal

Mesbah Khan

Hayden Atkinson

Andrew Mitchell
(University of Westminster)

Explaining measurements to machines

Carlos Gonçalves

(University of São Paulo)

Measurement in an Ancient Mesopotamian loan archive

11:40 Amphitheatre 310 (ENSA)

Luc Valentin 454A

Malevitch 483A

Mondrian 646A

David Andrich

(The University of Western Australia)

The Gaussian distribution as a culmination of the Rasch measurement theory of invariance

Dieter Hoffmann

(Max-Planck-Institut für Wissenschaftsgeschichte)

Wilhelm Kösters (1876–1950) and the development of a new standard of length based on the wavelength of light

Jean-Baptiste Grodwohl

(University of Cambridge)

Measuring natural selection in population genetics

Guy Sechrist

(University of Cambridge)

“False measures”: Seventeenth-century English gauging instruments and legitimizing English excise

12:20 Amphitheatre 310 (ENSA)

Luc Valentin 454A

Malevitch 483A

Mondrian 646A

A. Jan Kutylowski

(University of Oslo)

Measurement and modelling of categorical variables in the sociosciences: a comparison of traditional and modern approaches, with prospects for the future

Eckhard Wallis

(Institut de Mathématiques de Jussieu, Paris Rive Gauche)

Making clocks – Research at the Laboratoire de l'Horloge Atomique during the 1960s

Jean-Pierre Llored

(Université Paris Diderot)

Investigating measurement: The case of chemical metrology

Jennifer Egloff

(Zayed University)

Artisans' resistance to geometrical measurement techniques in the Early Modern English Atlantic: Challenging the persistent notion of linear change in mathematics

13:00-14:00 Lunch break - Buffet Amphitheatre 310 (ENSA PVS)

Thursday 28

Panel 11

Theory dependence, models, and idealization in measurement

Chair: Theodore Porter
(University of California, L.A.)

Panel 12

Errors of measurement in historical perspective

Chair: Giora Hon
(University of Haifa)

Panel 13

Measurement issues in the life sciences

Chair: Céline Lefève
(University Paris Diderot)

14:00 Amphitheatre 310 (ENSA PVS)

Kent Staley

(Saint Louis University)

An epistemological function for systematic uncertainty in measurements in high energy physics

14:40 Amphitheatre 310 (ENSA PVS)

Alessandro Giordani

(Università Cattolica del Sacro Cuore di Milano)

Luca Mari

(Università Cattaneo)

On theory dependence of truth in measurement

14:30 Luc Valentin 454A

Robert Míddeke-Conlin

(Max Planck Institute for the History of Science)

The limits of measured value in Ancient Mesopotamia

14:30 Mondrian 646A

Nádia Jardim

(University of Lisbon)

Measuring body functions at the turn of the 19th Century through serial photography and cinema

15:20 Amphitheatre 310 (ENSA PVS)

Qiu Lin

(Duke University)

Idealization and

Measurement:

A Comparative Case Study

15:10 Luc Valentin 454A

George Borg

(University of Pittsburgh)

Accentuating the positive: Observation and measurement in Kepler's optics

15:10 Mondrian 646A

Caterina Schuerch

(Ludwig-Maximilians-Universität München)

Quantification – the key to understanding physiological processes

16:00 Amphitheatre 310 (ENSA PVS)

Roman Zdzislaw Morawski

(Warsaw University of Technology)

Measurement as abduction

15:50 Luc Valentin 454A

Maarten Bullynck

(Université Paris VIII & SPHERE, Paris)

The fine distinctions of error. Getting knowledgeable about errors at the crossroads of theory, instrument and observation

15:50 Mondrian 646A

Daniel Ott

(University of Cambridge)

Can pain be measured? Emerging technologies, epistemological uncertainty, and pragmatic realism

16:30-17:00: Coffee break Amphitheatre 310 (ENSA PVS)

17:00 – 18:30

Amphitheatre 310
(ENSA PVS)

Keynote lecture 3

Chair: Christine Proust (CNRS, SPHERE)

Karine Chemla (CNRS, University Paris 7)

Quantities, standards, measurement and computation.
Views from mathematical sources from the ancient world

21:00 Conference dinner – Restaurant

Friday 29

Panel 14 (symposium)

The measurement of nonquantitative properties in the human sciences

Chair: Mark Wilson
(University of California, Berkeley)

Panel 15

Reconsidering the Representational theory of measurement

Chair: Michael Heidelberger
(University of Tübingen)

Panel 16

Constructing measurement: quantifications, institutions, and numerical notations

Chair: Nadine de Courtenay
(University Paris Diderot)

09:00 Luc Valentin 454A

Joshua McGrane

(University of Oxford)

An inclusive conception of measurement for the human sciences minus the philosophical baggage

Malevitch 483A

Matthias Neuber

(University of Tübingen)
Helmholtz, Kaila, and the Representational theory of measurement

Mondrian 646A

Daniel Jon Mitchell

(Rheinisch-Westfälische Technische Hochschule Aachen)
The second quantification of physics

09:40 Luc Valentin 454A

Trisha Nowland

(Macquarie University)

Rough set theory for psychometric research: A modest proposal

Malevitch 483A

Jean Baccelli

(Munich Center for Mathematical Philosophy)
Beyond the metrological viewpoint

Mondrian 646A

Frans Van Lunteren

(Vrije Universiteit, Amsterdam)
The International Bureau of Weights and Measures and the politics of science

10:20 Luc Valentin 454A

Alex Scharaschkin

(University of Oxford)

Measurement without quantification? The case of educational assessment

Malevitch 483A

Pierre Uzan

(SPHERE, Paris)

From measurement-representation to measurement as a semantic act

Mondrian 646A

Qiu Gaoxing

(China Jiliang University)

Imperial notation and Bodhisattva notation - Illustrated by the example of Avatamsaka Sutra

11:00-11:30: Coffee break Amphitheatre 310 (ENSA PVS)

11:30 – 13:00

Amphitheatre 310
(ENSA PVS)

Keynote lecture 4

Chair: Emmanuel Didier (ENS, CNRS & EHESS)

Oliver Schlaudt (University of Heidelberg)

“Who is there that doesn't calculate?”

The homo economicus as a measuring instrument

13:00 Closing

Connection to the WIFI network of ENSA Paris-Val de Seine

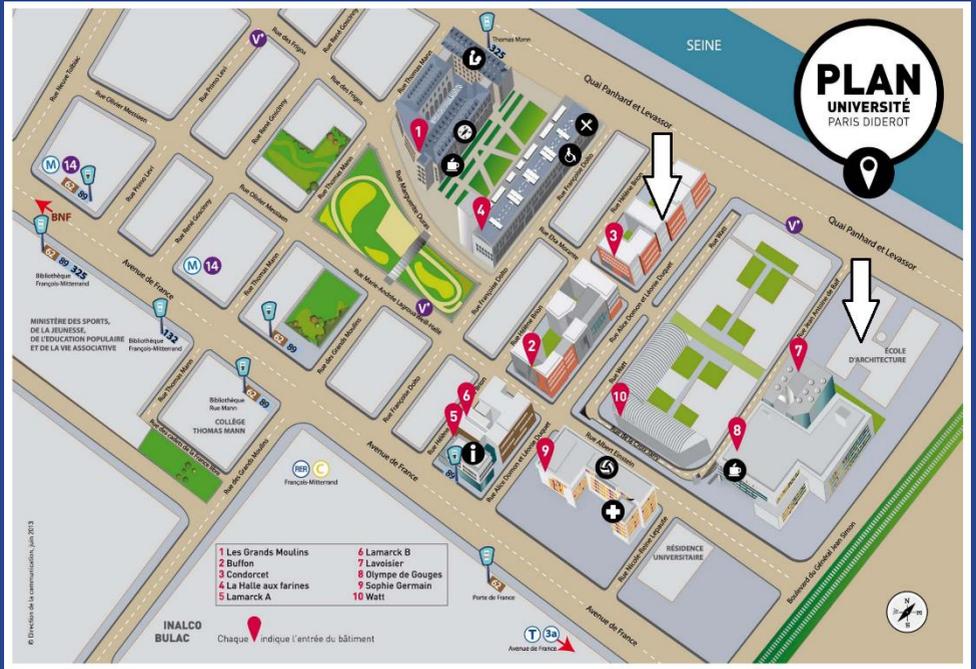
1. Choose the ENSAPVS network Guest
2. A page called "Log in / Welcome to ENSAPVS Guest » should open automatically. If not open any website page in your internet browser.
3. At the bottom of the "Log In" page choose "Create an account" (in blue)
4. Fill in the fields and validate
5. Go to your email account to VALIDATE the login link **within 10 minutes**

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13



Access by public transport:

- Underground line 14, RER C: station Bibliothèque François Mitterrand.
- Metro Line 6, station Quai de la Gare (10 minutes walk).
- Bus: 62, 89 / Stop: Bibliothèque rue Mann;
64: Bibliothèque François Mitterrand; 325: Watt.

Practical information:

- Restaurant (Wednesday 27): Dans la Cuisine, 54-56 avenue de France, 75013 Paris
- Restaurant (Thursday 28): Bouillon Racine, 3 Rue Racine, 75006 Paris
- Phone contact in case of emergency:
 - Justin Gabriel: +33 6 76 21 48 93
 - Christine Proust: +33 6 79 13 69 82

