



Interdisciplinary Scientific Center Poncelet (ISCP), IRL 2615

France



Russia



IUM



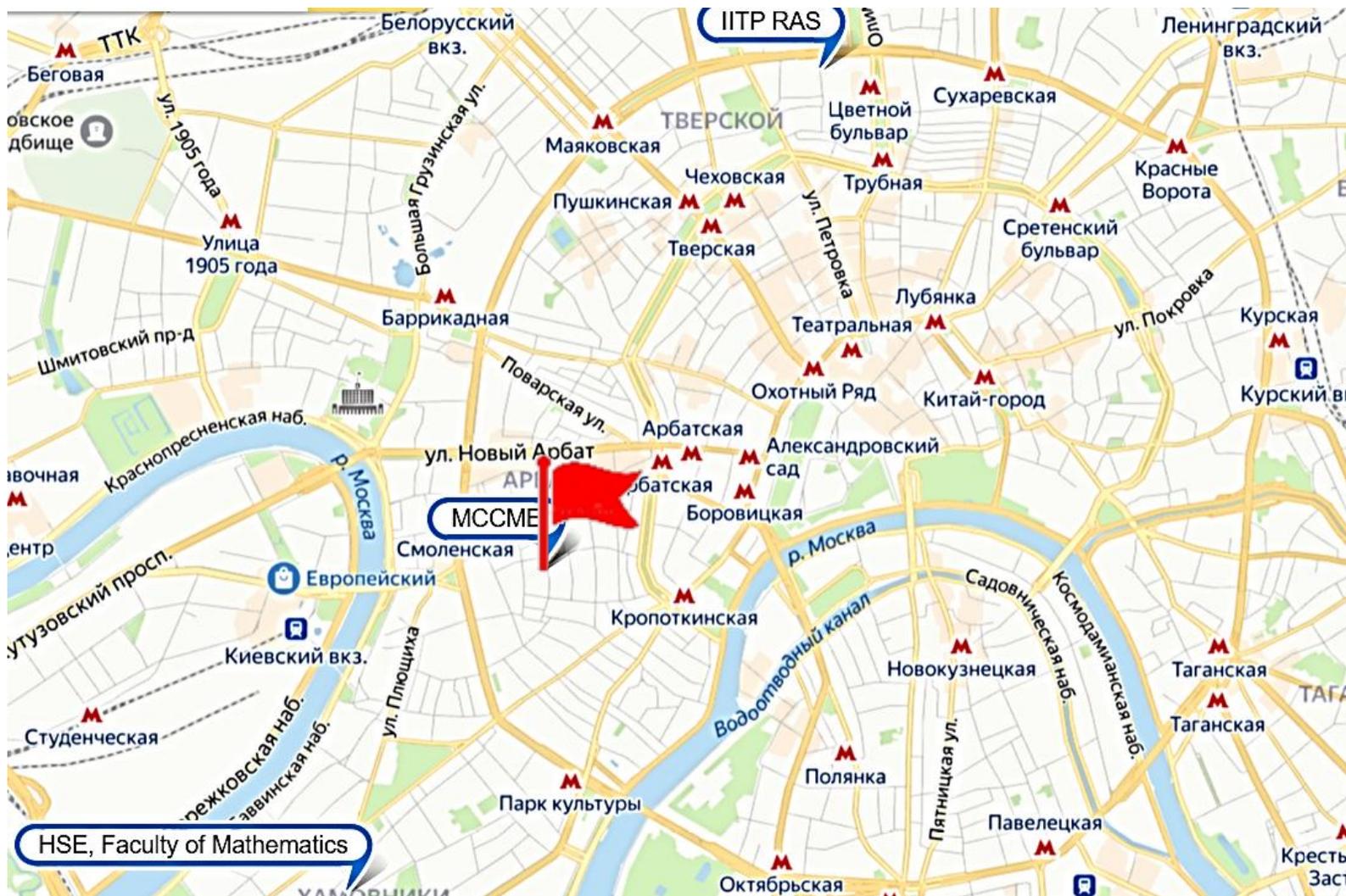
Skoltech
Skolkovo Institute of Science and Technology

Independent University of Moscow / Center for Continuous Mathematical Education
Bolshoy Vlas'yevskii, 11, Moscow



Laboratoire J.-V. Poncelet

Centre National de la Recherche Scientifique



Location in Moscow

**1. General information about the Interdisciplinary Scientific Center
Poncelet (ISCP) CNRS IRL 2615**

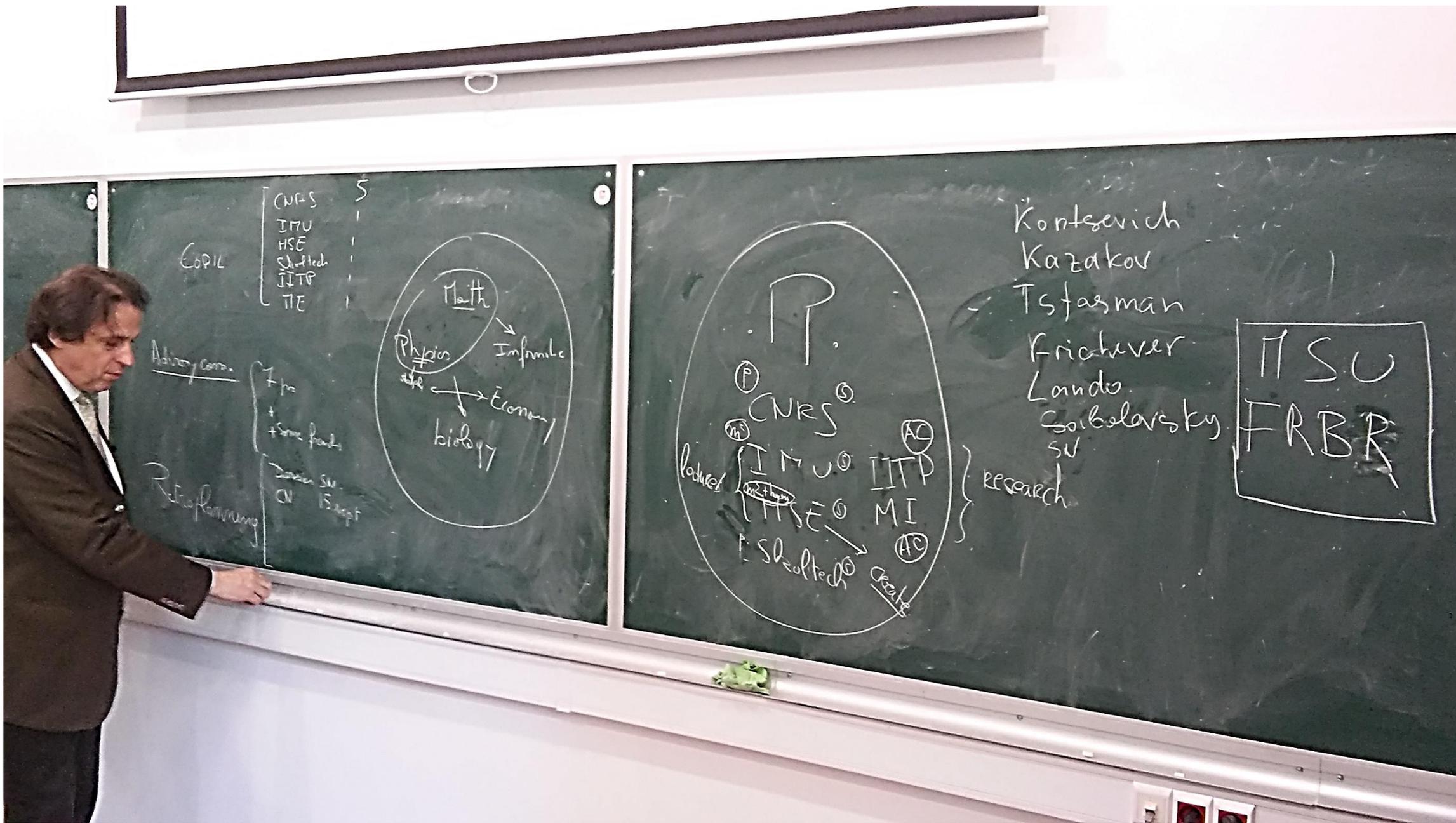


What is Interdisciplinary Scientific Center Poncelet (ISCP) now?

ISCP – **an interdisciplinary scientific hub** with free exchange of ideas, participation of leading Russian, French and International physicists and mathematicians, creative and friendly atmosphere of an international team, huge number of international events, light administration and access to excellent students and strong connection with leading regional Universities of the Russian Federation.

ISCP history in few lines:

- Founded in 2001 (CNRS UMI 2615) as “**LIFR MI²P**”
- 2001 – 2005: International Associated Laboratory LIFR MI²P (under supervision of the INSMI CNRS) with 3 Russian partners
- 2006 – 2016: Poncelet Lab: UMI (under supervision of the INSMI CNRS) with 3 Russian partners (and INRIA from 2006 to 2013)
- Since 2017: ISCP, IRL (under supervision of the INP, INSMI secondary Institute) with 5 Russian partners (**Higher School of Economics, Steklov Mathematical Institute, Institute for Information Transmission Problems, Independent Moscow University, Skoltech**).
- Recently ISCP carries research in mathematical physics, mathematics, informatics (including bioinformatics)



Poncelet Center, 2017: Prof. Alain Schuhl, Directeur général au CNRS délégué à la science

The mission of ISCP

- To advance in “group dynamic win-win game”, where both players, France and Russia win due to enforced scientific cooperation and student exchange

ISCP: principles of functioning

- **Conducting research** in mathematical physics, mathematics, informatics (including bioinformatics) and brain studies
- **A hub for interaction** between world known and actively working physicists, mathematicians, and (bio)informaticians, involving talented young researchers
- **Organizing** international conferences and schools on a regular basis
- **Developing direct scientific contact** with research groups in France and in Russian Federation (Saint-Petersburg, Novosibirsk, Tomsk, Vladivostok) in the areas of math and physics
- **Becoming a communication and teaching platform** (Members of the Poncelet Center teach at IUM, HSE, MSU, Skoltech)

Scientific topics

(2001-2016)

- Topology and algebraic geometry
- Arithmetic geometry and number theory
- Combinatorics and representation theory
- Logics, category theory and complexity
- Dynamical systems and probability theory

(2016-2019)

- Conformal theory and integrable systems
- Statistical physics and soft matter (including complex systems)
- String theory
- Informatics and bioinformatics

(2019-2021)

- Network analysis and machine learning for 3D genomics and brain studies

Strategy: main principles of international collaboration

- **“Bottom-up” communication** (personal level → Laboratories → Universities)
- **Synergy**: to push forward only such scientific directions which are well developed both in Russia and in France (as theoretical and mathematical physics, informatics, bioinformatics and genomic research)
- **Light administrative structure** (scientists should not spend too much time to write reports and apply for grants)
- **Participation of regional Universities and research centers of Russia** in international collaboration
- Invitation of highly qualified specialists for **seminars** and **crash courses**
- **“Research in pairs”** with partners from scientific centers in Russia (we cover tickets, provide housing for free up to one month and ensure working place at the Poncelet Center)
- We have launched discussion with Paris-Saclay University about more intensive mobility of young researchers (application for the support is sent to the Hadamard Foundation)

Samples of crash courses

2017

  Interdisciplinary Scientific Center Poncelet and Skoltech announce
2-day Minicourse

Extreme Value Statistics in Random Matrix Theory

Satya MAJUMDAR Gregory SCHEHR



Top eigenvalue of a random matrix: Tracy-Widom distribution and third order phase transition



Non-Intersecting Brownian motions: from Random matrices to Yang-Mills theory

*Laboratoire de Physique Théorique et Modèles Statistiques (LPTMS)
Université Paris Sud, France*

May 22-23, 2017
Independent University of Moscow, room 401, 11⁰⁰ - 15⁰⁰
Bolshoy Vlasievsky, 11

11-00 - 12-30:	Satya Majumdar
14-00 - 15-30:	Gregory Schehr

2019

  Skoltech and Interdisciplinary Scientific Center Poncelet announce a minicourse

Computer Simulation of Polymers: Entanglements and Topological Constraints

Ralf EVERAERS Angelo ROSA
(ENS, Lyon, France) (SISSA, Trieste, Italy)



Computer simulations of entangled polymers



From eukaryotic chromosomes to physics of crumpled ring polymers

May 27-28, 2019
Independent University of Moscow, room 401, 10⁰⁰ - 16³⁰
Bolshoy Vlasievsky pereulok, 11

May 27: 10:00 – 11:30:	Ralf Everaers	May 28: 10:00 – 11:30:	Angelo Rosa
12:00 – 13:30:	Ralf Everaers	12:00 – 13:30:	Ralf Everaers
15:00 – 16:30:	Angelo Rosa	15:00 – 16:30:	Angelo Rosa

Ralf Everaers, **Computer simulations of entangled polymers** (three lectures)

Diffusing polymers can slide past each other, but their Brownian motion is subject to transient topological constraints, since the chain backbones cannot cross. The microscopic «entanglements» dominate the characteristic viscoelastic behavior, which polymers display macroscopically. In my lecture, I will first review the Rouse and the Edwards/de Gennes tube models of polymer dynamics. In the second part, I will introduce the Kremer-Grest bead-spring model and computational techniques used for simulating these generic model systems. The central part of the lecture focuses on the question, how computer simulations can be used to explore the physics underlying the tube model. In the final part, I discuss how to design *material-specific* Kremer-Grest models for commodity polymer melts.

Angelo Rosa, **From eukaryotic chromosomes to physics of crumpled ring polymers** (three lectures)

In these lectures, I will first introduce the audience to the relevant phenomenology of chromosome organization inside the nuclei of eukaryotic cells. Then, by employing simple and generic physical arguments, I will discuss how chromosome folding can be understood based on the analogy to unknotted and unlinked ring polymers which adopt "crumpled" conformations in dense solutions. The explanation of this analogy will offer the opportunity to discuss in detail the rich phenomenology of ring polymers: in particular, I will report about recent theoretical and computational work addressing the debated connection between ring polymers and melts of branched polymers.

Contact: kryukovaliza@gmail.com, Web page: www.poncelet.ru
No inscription is previewed

Samples of conferences

workshop
QUANTUM INFORMATION & TOPOLOGICAL RECURSION
QUATR17 Moscow
 June 19-23, 2019

The ideal of the meeting is to establish and strengthen links between the two actively developing fields of knowledge: Quantum Information and Random Matrix Theory in its modern disguise of Topological Recursion. The conference is partly educational: it includes a series of lectures by senior researchers for PhD students and post-docs and informal discussion sessions

ORGANIZING COMMITTEE
 Leonid Chekhov (Steklov Inst., Skoltech & Center Poncelet), Igor Krichever (Skoltech, HSE & Columbia Univ.), Sergei Lando (Skoltech & HSE), Sergei Nechaev (Center Poncelet), Anton Zabrodin (Semenov Inst., Skoltech, HSE & ITEP)

PROGRAM COMMITTEE
 Alexandr Holevo (Steklov Inst.), Andrei Marshakov (Skoltech, HSE, Lebedev Inst. & ITEP), Pavel Pyatov (HSE & JINR), Jan Philip Solovej (QMATH, Univ. of Copenhagen)

KEY SPEAKERS INCLUDE:
 Vladimir Bazhanov (Australian Nat. Univ.), Petr Dunin-Barkowski (Amsterdam Univ., HSE & ITEP), Ezra Getzler (Northwestern Univ.), Maxim Kazarian (Steklov Inst., Skoltech & HSE), Sergei Nechaev (Center Poncelet), Ion Nechita (Toulouse Univ.), Piotr Sulkowski (Warsaw Univ. & Caltech), and others

for more information please see
<http://crei.skoltech.ru/cas/calendar/conf170619/>

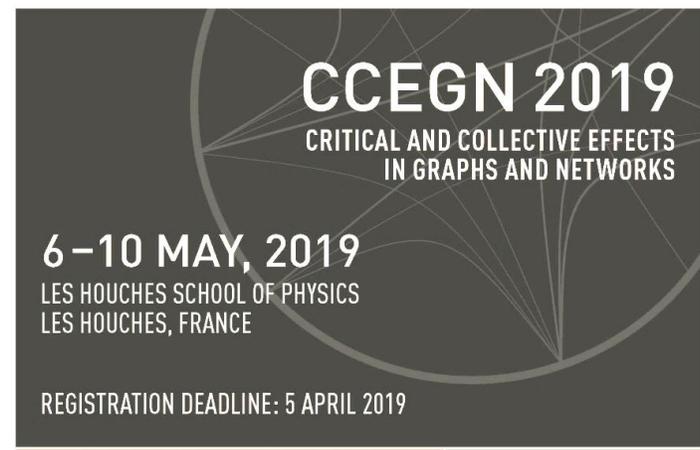


CCEGN 2019
 CRITICAL AND COLLECTIVE EFFECTS
 IN GRAPHS AND NETWORKS

CCEGN 2019
 CRITICAL AND COLLECTIVE EFFECTS
 IN GRAPHS AND NETWORKS

6-10 MAY, 2019
 LES HOUCHEs SCHOOL OF PHYSICS
 LES HOUCHEs, FRANCE

REGISTRATION DEADLINE: 5 APRIL 2019



TOPICS INCLUDE

- Spreading phenomena and other dynamical process on networks, Griffiths phases and spectral methods
- Metric structure of random graphs, and spatially embedded random graphs
- Random graphs with quenched disorder, microcanonical and canonical ensembles of random graphs, phase transitions, belief propagation and related questions
- Statistical methods in interdisciplinary applications: social and ecological networks, genomic networks, neuroscience

SPEAKERS

- Marc Barthelemy (France)
- Ginestra Bianconi (UK)
- Zdzislaw Burda (Poland)
- Sergey Dorogovtsev (Portugal, Russia)
- Ernesto Estrada (UK)
- Alex Fornito (Australia)
- Laetitia Gauvin (Italy)
- James Gleeson (Ireland)
- Joaquin Gonii (USA)
- Clara Granel (Spain)
- Roger Guimerà (Spain)
- Byungnam Kahng (Korea)
- Pavel Kravitsky (USA)
- Vito Latora (UK)
- Kristina Lerman (USA)
- Sergei Maslov (USA)
- Adilson Motter (USA)
- Fragkiskos Papadopoulos (Cyprus)
- Tiago Peixoto (UK, Italy)
- Mariangeles Serrano (Spain)
- Zoltan Toroczkai (USA)
- Lenka Zdeborova (France)

ORGANIZERS

- Prof. Alex Arenas (Universitat Rovira i Virgili, Tarragona, Spain)
- Prof. Alexander Gorsky (IITP, RAS and MIPT, Russia)
- Prof. Dmitri Krioukov (Northeastern University, USA)
- Dr. Sergei Nechaev (ISCP, Russia-France and LPTMS)

CONTACT
ccegn2019-oc@googlegroups.com



www.poncelet.ru/conference/critical-and-collective-effects-graphs-and-networks-2019

Recent advances in mass transportation Moscow, Higher School of Economics and Interdisciplinary Scientific Center Poncelet 23 - 27 September, 2019

The workshop will feature a series of expository mini-courses on principal directions of recent research in the broad area of mass transportation, given by renowned and active researchers in the field. These mini-courses will be accompanied by a series of talks by participants on some recent advances in particular topics related to the subject. The topics to be covered include transport, continuity and related PDEs with non smooth data, geometry of metric spaces with CD and RCD type properties, generalizations and applications of Kantorovich-Wasserstein distance in various areas of mathematics, applications of mass transportation in probability and statistics, as well as in economics, urban planning and game theory.

Minicourses

Giovanni Alberti (Università di Pisa, Italy)
 Filippo Santambrogio (Université de Lyon, France)
 Dario Trevisan (Università di Pisa, Italy)



Organizers
 Vladimir Bogachev (Moscow State University and Higher School of Economics, Moscow)
 Anatoly Vershik (St. Petersburg branch of the Steklov Mathematical Institute, St. Petersburg and Higher School of Economics, Moscow)
 Alexander Kolesnikov (Higher School of Economics, Moscow)
 Alexey Naumov (Head of HDI Lab at Higher School of Economics, Moscow)
 Sergei Nechaev (Director of Center J.-V. Poncelet)

Speakers

Yurii Averboukh (IMM UB RAS)
 Bai Bo (Huawei)
 Sergey Bobkov (University of Minnesota, HSE)
 Dmitry Bukin (MSU)
 Anna Dolecenok (MSU)
 Pavel Dvurechensky (WIAS)
 Thibaut Le Gouic (HSE)
 Sergey Guminov (MIPT)
 Alexander Guschin (HSE)
 Nikolay Gusev (MIPT)
 Alexander Kallinin (MSU)
 Alexey Kroshnin (IITP, HSE)
 Mikhail Lifshits (SPBU)
 Mario Mariani (HSE)
 Quentin Paris (HSE)
 Fedor Petrov (St. Petersburg Department of Steklov Institute)

Vladimir Spokoyny (St. Petersburg Institute of WIAS, HSE)
 Mehdi Teneze (ENS Paris)
 Nazarii Tupitsa (MIPT)
 Anatoly Vershik (St. Petersburg Department of Steklov Institute)

<https://www.poncelet.ru/conference/recent-advances-mass-transportation>



Theoretical physics and mathematics of the brain: Bridges across disciplines and applications

4 December 2019 – Moscow State University
 5 December 2019 – Skoltech, Moscow

Topics:

- Geometric and dynamic properties of brain networks
- Brains as a critical system
- Information and entropic aspects of brain functioning
- Topological data analysis
- Connectome as a statistical system

Speakers:

- Konstantin Anokhin (MSU, Moscow)
- Anton Ayzenberg (HSE, Moscow)
- Alexander Bernstein (Skoltech, Moscow)
- Roman Borisyuk (Univ. of Exeter, UK)
- Vsevolod Chernyshev (HSE, Moscow)
- Alexander Gorsky (IITP, Moscow)
- Vladimir Itskov (PSU, USA)
- Yakov Kazanovich (IMPB, Pushino)
- Victor Kazantsev (Lobachevskii Univ., Nizhny Novgorod)
- Alexey Koulakov (CSHL, USA)
- Vladimir Nekorkin (IAP, Nizhny Novgorod)
- Alexey Ossadtchi (HSE, Moscow)
- Elena Popova (Skoltech, Moscow)
- Nikita Pospelov (MSU, Moscow)
- Vadim Ushakov (Kurchatov Inst, Moscow)

Organizers:

- Konstantin Anokhin (MSU, Moscow)
- Alexander Gorsky (IITP, Moscow)
- Yurii Kotelevtsev (Skoltech, Moscow)
- Sergei Nechaev (Center Poncelet, France)




Information: www.poncelet.ru

2. Poncelet Center in numbers (2016-2021)

2016-2021

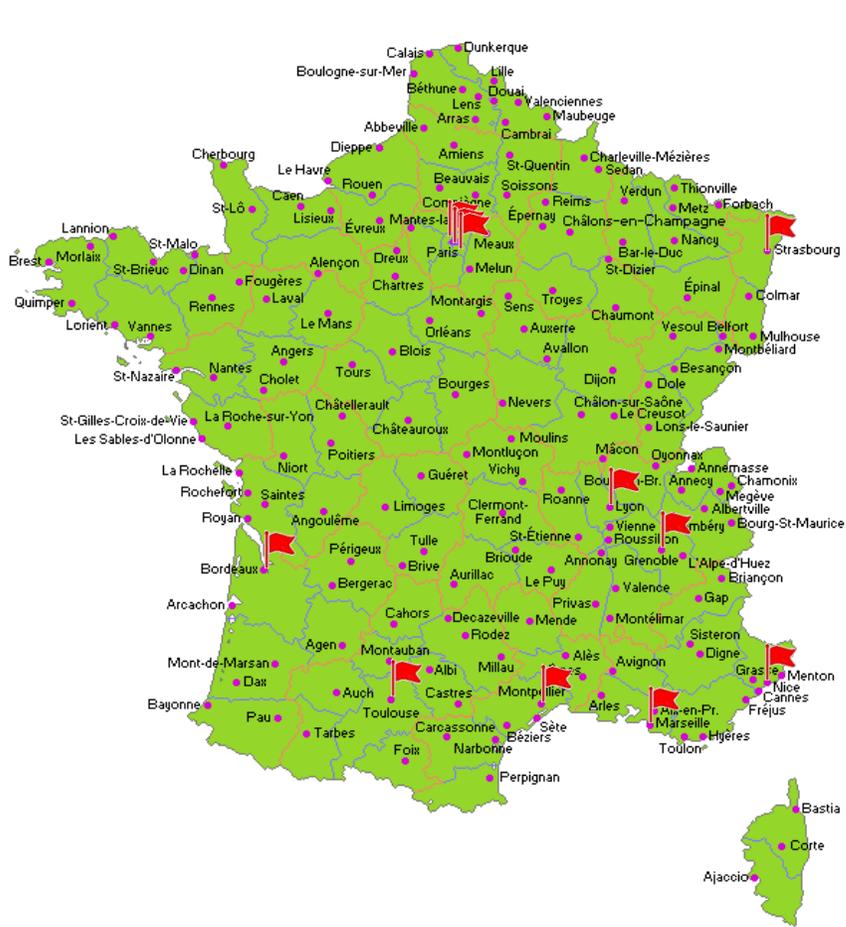
- Poncelet Center hosted **110 short international visits** (including **4** Fields medal laureats)
- Poncelet Center hosted **11** long-stay visitors (CNRS) during 2016-2021(2022)
 - Vitaly Volpert, since 1 May 2016 (1 year)
 - Denis Grebenkov, since 2 January 2017 (1 year)
 - Michael Pevzner, since 17 September 2017 (1 months)
 - Pierre Guillon, since 1 April 2018 (1 year)
 - Gleb Oshanin, since 1 may 2019 (8 months)
 - Oleg Ogievetsky, since 1 September 2019 (1 year)
 - Ekaterina Amerik, since 1 February 2020 (6 months)
 - Marc Hindry, since 1 February 2020 (continued, waiting for lockdown cancellation)
 - Vladimir Kazakov, 2021-2022
 - Cedric Bernardin, 2021-2022
 - Marc Hindry (will come in 2022)

2016-2021

- The members of Poncelet Center participated in more than **20 grants** (local and International)
Currently continued: Russian Science Foundation (RSF): **5**, Russian Foundation for Basic Research (RFBR): **6**, Basis (Theoretical Physics and Mathematics Advancement Foundation): **3**, ANR: **2**, ANR-RSF: **1**, PRC: **1**
- The Poncelet Center has mentioned in over **120 publications** (since 2016)
- The Poncelet Center has organized jointly with co-founders **44 local and international events (conferences, schools and workshops)** with active participation of scientists from France: **8** (2016), **10** (2017), **7**(2018), **10** (2019), **7** (2020), **2** (2021)
- Researchers of Poncelet Center participated and organized University courses (IUM, Moscow Inst. of Phys. and Tech., Higher School of Economics, Moscow State University, etc.)

3. Collaboration with regional Universities in France and in Russia

Geography of scientific collaborations



ENS (Paris), U. Paris–Sorbonne, U. Paris–Saclay, Ecole Polytechnique, U. Marne-la-Valle, ESPCI, U. Versailles, ENS (Lyon), U. Grenoble Alpes, U. Aix-Marseille, U. Nice Sophie-Antipolis, U. Montpellier

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|----------------------|------------------------------------|-----------------|------------------|----------------------------------|-----------------------------|---------------------|
| MIPT
(Moscow) | Lebedev
Physical I.
(Moscow) | MSU
(Moscow) | JINR
(Dubna) | Chebyshev
Lab
(St.Petersb) | ITMO
(St.Petersb) | RFBR
Foundation |
| FEFU
(Vladivost.) | Novosibirsk
Univ. | Tomsk
Univ. | Saratov
Univ. | Rostov-on-
Don Fed.
Univ. | Nizhny
Novgorod
Univ. | Landau
Institute |

Welcome to Interdisciplinary Scientific Center Poncelet (ISCP)!

<https://www.poncelet.ru/>

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