

# Equipe ICI

## Responsable de l'équipe

[Arsenia \(Ersi\) Chorti](#), Maître de conférences, ENSEA.

## Membres

Au 1er décembre 2018, l'équipe comporte 31 personnes:

- 13 enseignants-chercheurs (2 PU, 9 MCF, 2 CR)
  - [Iryna Andriyanova](#) (MCF UCP),
  - [E. Veronica Belmega](#) (MCF ENSEA),
  - [Marwa Chafii](#) (MCF ENSEA)
  - [Arsenia Chorti](#) (MCF ENSEA),
  - [Inbar Fijalkow](#) (PU ENSEA),
  - [Maël Le Treust](#) (CR CNRS),
  - [Laura Luzzi](#) (MCF ENSEA),
  - [Sylvain Reynal](#) (MCF ENSEA),
  - [Ligong Wang](#) (CR CNRS),
  - [Claudio Weidmann](#) (MCF UCP)
  - Michel Chapron (MCF ENSEA),
  - Christian Faye (MCF ENSEA),
  - [Mai Nguyen-Verger](#) (PU UCP).
- 2 ATER
- 16 [doctorants](#)

## Axes de recherche

Les activités de recherche de l'équipe ICI s'articulent autour de quatres axes:

1. [Codage correcteur d'erreurs](#)
2. [Théorie de l'information](#)
3. [Allocation des ressources](#)
4. [Imagerie](#)

# Projets de recherche

[Projets en cours](#)

[Projets passés](#)

## Quelques faits marquants

### Increased international visibility of information theory research

Team ICI has recruited two CNRS junior researchers working on Information Theory: Maël Le Treust joined in Oct. 2013 and Ligong Wang in Nov. 2014. ICI is now one of the main French research groups in Information Theory, with activities in physical layer security, lattice coding, universal codes for MIMO fading channels, diversity-multiplexing gain trade-off, optical and covert communication, coordination of autonomous devices and strategic communication. Iryna Andriyanova is member of the organization committee of the flagship conference of information theory IEEE ISIT 2019 to be held in Paris. ICI's attractiveness is also demonstrated by the ongoing stream of excellent CNRS candidates choosing ETIS-ICI (one admissible CR1 in 2016, one admissible CR in 2018). We also fostered international collaborations with MIT, ETH Zurich, Georgia Tech Atlanta, Imperial College London, Aalto University, INRS Montréal, Univ. Federico Santa Maria Santiago de Chili, KTH Stockholm by mutual visits. Ligong Wang submitted an ERC Starting Grant proposal "SCREAM" which has been successful in the first round (Step 1) of the evaluation; an interview with the evaluation panel of ERC will take place in June 2018.

Outstanding publications include:

- Semantically secure lattice codes for the Gaussian wiretap channel. C Ling, L Luzzi, JC Belfiore, D Stehlé IEEE Transactions on Information Theory 60 (10), pp. 6399-6416, 2014.
- Almost universal codes achieving ergodic MIMO capacity within a constant gap. L Luzzi, R Vehkalahti IEEE Transactions on Information Theory 63 (5), pp. 3224-3241, 2017
- Fundamental limits of communication with low probability of detection. L Wang, GW Wornell, L Zheng IEEE Transactions on Information Theory 62 (6), pp. 3493-3503, 2016.
- Joint Empirical Coordination of Source and Channel. M Le Treust IEEE Transactions on Information Theory 63 (8), pp. 5087-5114, 2017.

Several research projects are currently running: one PhD student funded by EDSI University of Cergy-Pontoise: Giulia Cervia, started in Oct. 2015 with Laura Luzzi and Maël Le Treust (polar codes for coordination). Two PhD students are funded by ISITE Paris-Seine: Anastacia Londono, started in Nov. 2017 with Ligong Wang (covert communications) and Charbel Saliba started in Oct. 2017 with Laura Luzzi (secret key generation).

### Energy efficient telecommunications

This research axis has also increased its international visibility thanks to EU NoE Newcom# (ongoing

collaboration of EV Belmega with G. Bacci and L. Sanguinetti), the sabbatical year of I. Fijalkow at UC Irvine and the hiring of A. Chorti in 2017 (University of Essex). Several national and international project proposals in this area are currently under evaluation.

Outstanding publications include:

- Energy-aware competitive power allocation for heterogeneous networks under QoS constraints G Bacci, EV Belmega, P Mertikopoulos, L Sanguinetti IEEE Transactions on Wireless Communications 14 (9), 4728-4742, 2015
- Analysis of One-Bit Quantized Precoding for the Multiuser Massive MIMO Downlink AK Saxena, I Fijalkow, AL Swindlehurst IEEE transactions on Signal Processing 65 (17), pp. 4624--4634, 2017.