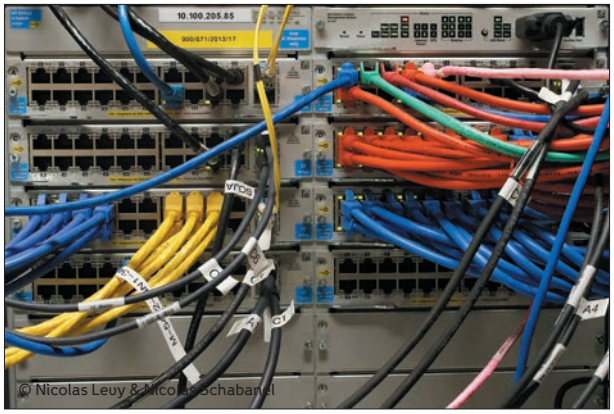
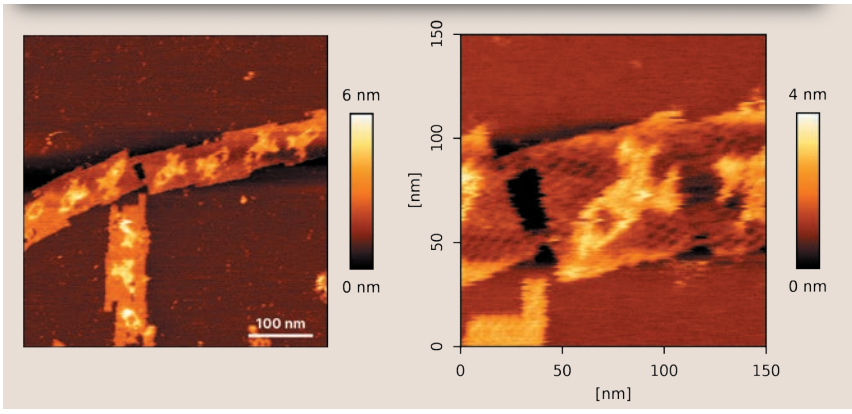
PARALLEL COMPUTATION LABORATORY – LIP

ANTICIPATING THE DIGITAL WORLD OF THE FUTURE: FROM FUNDAMENTAL ASPECTS OF COMPUTING TO APPLICATIONS

http://www.ens-lyon.fr/LIP





RESEARCH TOPICS

- HIGH-PERFORMANCE COMPUTING AND COMMUNICATION
- DISCRETE STRUCTURES: COMBINATORICS, ALGORITHMS, MODELS
- LANGUAGES, COMPILATION, SEMANTICS, PROOFS

CROSS-CUTTING THEMES

- ARITHMETIC, COMPUTER ALGEBRA, CRYPTOGRAPHY
- ARCHITECTURE, OPERATING SYSTEMS, HPC
- STATISTICAL LEARNING
- COMPILATION AND ANALYSIS
- NETWORKS
- COMPUTATIONAL MODELS, COMBINATORICS AND COMPLEXITY
- PROGRAMS, PROOFS
- OPTIMIZATION, SCHEDULING

RESEARCH EQUIPMENT AND TOOLS

Experimentation platforms:

- Computer servers
- Experimental network platforms and high-performance computing
- Grid'5000 nodes
- High-performance networks
- Sensor networks

KEY FIGURES

130	staff including **62** researchers, **47** PhD students and **9** post-doctoral fellows and **12** research support staff
Over the last 5 years:	
883	publications (**404** journals and **479** conference articles)
9	prizes and distinctions including **1** CNRS medal and **2** IUF
31	public funding (including **2** ERC, **1** AI Chair, **16** ANR)
17	private financing
5	intellectual properties including **1** family of active patents and **4** valuable software
3	start-ups

TRL scale between 1 and 5

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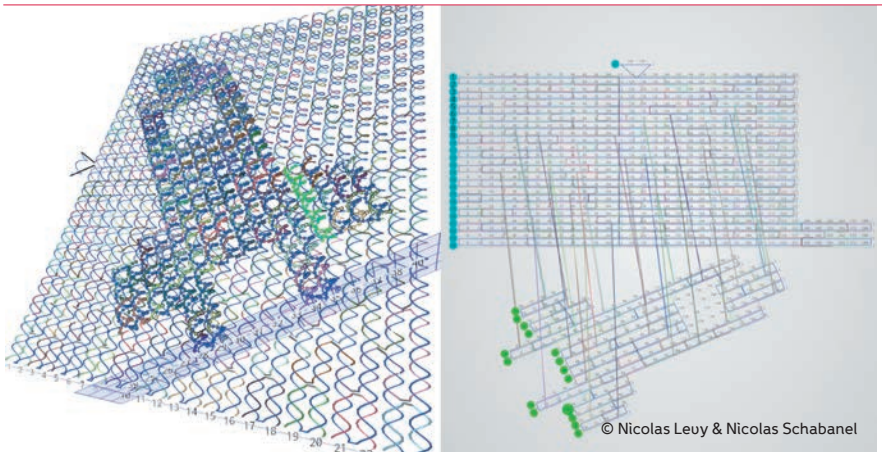

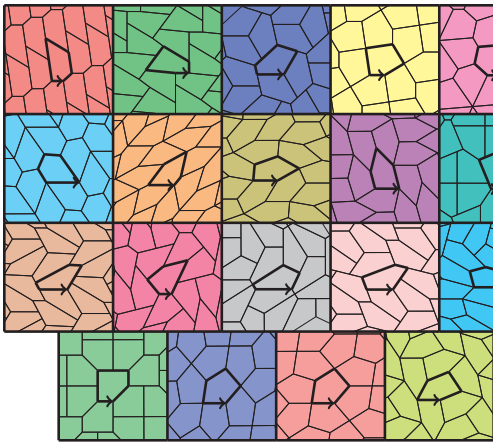

FROM THE LABORATORY TO THE SOCIO-ECONOMIC WORLD

- Dense relational fabric with computer science and mathematics laboratories in France (IXXI, UMPA, LAAS, etc.) and internationally (United States, Italy, Asia, etc.).
- Collaborations, services, European and national contracts with multinationals: telecommunications, electronics, energy, transport, management, etc.

FOCUS ON

Institutional partnership research

• **CIFRE collaboration with ORANGE.**

> Study topic: Optimizing the placement of software licenses for network functions in the cloud for cost-effective and efficient deployment.

> Objective: model software costs, manage the dynamics of software allocation according to costs, set up a platform, test feasibility.

Private partnership research

• **Collaboration: Development of the MUMPS (MUltifrontal Massively Parallel sparse direct Solver)** software for solving systems of linear sparse equations, available in free access, as a result of collaboration with laboratories in Toulouse and Bordeaux.

> Phase 1: establishment of a consortium between the laboratories and international groups, mostly private (EDF, Michelin, Airbus, Total, Safran, Siemens, Berkeley Lab, FFT, Altair, ESI-Group, Shell, LSTC) in order to support the R&D activities and to promote the software.

> Phase 2: the MUMPS TECHNOLOGIES start-up, currently hosted by the ENS de Lyon incubator, offers partnership contracts to industrialists for the MUMPS software. In addition to advice and support, this partnership provides for the availability of early versions, but also the sharing of experiences and the possibility of suggesting future developments of common interest.

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