







des Ponts et Chaussées

Navier



A4 Sortie PARIS Université de Mar Noisy-le-Grand innant de Metz/Nancy one R.E.R. A4 Sortie Champs-sur-Marne en venant de Park Aéroports d'ORLY Direction LYON

UNIVERSITÉ — PARIS-EST

http://navier.enpc.fr/

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- 48 permanent researchers
 (29 Ecole des Ponts, 15 LCPC,
 4 CNRS)
- 18 engineers and technicians
- **10** administrative assistants
- 80 PhD students and postdoc

Mechanics and physics of materials, structures and geomaterials

Civil engineering

Sustainability

Geotechnics

Experimentation, Imaging, Modeling, Upscaling, Numerical modeling







Mechanics and physics of materials and structures Civil engineering, soil mechanics

MRI (magnetic resonance imaging)



bought by Ecole des Ponts in 1999



The teams



Mechanics and physics of materials and structures Civil engineering, soil mechanics

X-ray microtomograph



Delivered at the end of 2010



The teams

Quelques exemples d'images obtenues à Navier

Essai d'imbibition d'eau dans un échantillon de bois

Résolution: 160µm, Taille d'échantillon: 12cm



Caractérisation de porosité dans un mortier



Caractérisation de la microstructure dans un sable non-saturé



PARIS-EST



Fracturation dans un composite SiC/SiC





Mechanics and physics of materials and structures Civil engineering, soil mechanics

Simple shear ring apparatus

patented by Ecole des Ponts in 1997





Composite materials

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CERMES	MICROMECHANICS	STRUCTURES	DYNAMICS	POROUS	RHEOPHYSICS	IMAGING a	& MATERIALS



Behavior of layered materials Defects Plate models Failure criteria Experimental validations Microscopic scales







Reinforcement Behavior under cyclic loading Failure



Imaging materials

CERMES	MICROM	ECHANICS	STRUCTURES	DYNAMICS	POROUS	RHEOPHYSICS	& MATERIALS



Magnetic Resonance Imaging

X-ray microtomography

See materials as they evolve, at several scales. Microstructures and heterogeneities



Field measurements

In situ solicitations













Geological storage of CO_2

