

WORKSHOP
RHEOLOGY IN COMPOSITES PROCESSING

NANTES, FRANCE,
4-5 SEPTEMBER 2017



WELCOME

Over the last decades, an increasing number of functional and structural parts has been reengineered by replacing metallic materials by polymers, reinforced polymers and composites. The motivation for this substitution may be the weight reduction, the simpler, cheaper or faster forming process, or the ability to exploit additional functionalities.

The fillers usually employed cover a broad range involving many scales: (i) the nanometer scale (e.g. carbon nanotubes, graphene); (ii) the micrometer to the millimeter scale (particles and short fibers); (iii) the centimeter (e.g. SMC patches); and (iv) the macroscopic scale (continuous fibers arranged in bundles).

In the case of continuous fiber reinforced polymers, the impregnation of the reinforcement with a low viscosity polymer involves the flow of a (non-)Newtonian fluid in the complex multi-scale microstructure related to the fiber and tow arrangement. The use of nano-charges raises new challenges such as dispersion of charges into the polymer matrix involving aggregation and disaggregation mechanisms.

In this workshop we expect covering advanced technics related to the multi-scale modelling and simulation of polymers, reinforced polymers and composites processes, involving flowing microstructures and flows inside a nearly stationary multi-scale microstructure.

ORGANIZATION

CHAIRMEN:

Emmanuelle Abisset -ICI, Ecole Centrale de Nantes
Francisco Chinesta -ICI, Ecole Centrale de Nantes

SPONSORS:

GFR, ESI Group, Chaires ESI-ECN & ENSAM, École Centrale de Nantes

INVITED SPEAKERS

Emmanuelle ABISSET	ICI, Nantes
Gilles AUSIAS	LIMATB, Lorient
Anais BARASINSKI	GeM, Nantes
Philippe CASSAGNAU	IMP, Lyon
Paco CHINESTA	ICI, Nantes
Laurent DUFORT	ESI Group
Mickaël KREMSKI	AIRBUS Safran Launchers
Laurent ORGEAS	IS3R, Grenoble
Gilles REGNIER	PIMM, Paris
Luisa SILVA	ICI, Nantes
Bruno VERGNES	Cemef, Nice
Michel VINCENT	Cemef, Nice

KEY WORDS

- Concentrated suspensions: Nanocomposites, Short Fibre Reinforced Thermoplastics, SMC, Foams...
- Long fibres: TIF model, Preforms, Laminates
- Saturated & unsaturated permeability for linear and nonlinear fluids, etc.
- Conventional and nonconventional processes (Additive manufacturing, 3D printing, Automated tape placement, ...)
- Multiscale aspects of consolidation with special emphasis on multiphysics at interfaces

TENTATIVE PROGRAM

4 SEPTEMBRE

10h-10h30 : Welcome

10h30-11h10 : Rheological characterization of suspensions and nano-composites, *Bruno Vergnes*

11h10-11h50 : Rheology of natural fiber reinforced thermoplastics for injection, *Michel Vincent*

11h50-12h30 : Rheology and induced properties of nanotubes and nanoparticles suspensions, *Philippe Cassagnau*

12h30-14h00 : Déjeuner

14h00-14h40 : Additive Manufacturing, *Gilles Régnier*

14h40-15h20 : Prepreg surface properties and modelisation for consolidation in ATP process, *Anaïs Barasinski*

15h20-16h00 : Pause café

16h00-17h00 : In situ consolidation of thermoplastic composites for space applications : actual limitations and opportunities, *Mickaël Kreminski*

17h00-18h00 : Filtration simulation for LCM processes, Laurent Dufort, ESI

20h00 : Diner

5 SEPTEMBRE

08h30-09h10 : SMC process modeling : from dilute to percolated regim, *Emmanuelle Abisset-Chavanne*

09h10-09h50 : Complex flows simulations : short, long and continuous (TIF) fiber suspensions, *Francisco Chinesta*

09h50-10h20 : Pause café

10h20-11h40 : Direct simulations, *Luisa Silva et Gilles Ausias*

11h40-12h10 : Very concentrated suspensions modeling, *Laurent Orgéas*

IMPORTANT DATES

- Inscription

July 15th 2017

WORKSHOP FEE

Conference fees: 150€ including coffee breaks, lunches and diner.

VENUE

The workshop takes place at the École Centrale de Nantes, amphi S.

Hotels: <http://reservation.nantes-tourisme.com/fr/hebergements>



INSCRIPTION

Send an e-mail to Emmanuelle Abisset-Chavanne (emmanuelle.abisset-chavanne@ec-nantes.fr) with your Name, First name, and your affiliation.

The fees will be paid to:

Mme L'AGENT COMPTABLE DE L'E.C.N.
TP NANTES TG 10071 44000 00001000266 40
4 quai de Versailles BP 93503
44035 NANTES Cedex 1

N° IBAN:	FR76 1007 1440 0000 0010 0026 640
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