UNIVERSITÉ SAVOIE MONT BLANC

SYMME

SYstems and Materials for Mechatronics

EA 4144 - USMB

Faculty: Polytech Annecy-Chambéry

PhD school: Science and Engineering of Systems, of Environment and of Organisation (SISEO)

FIELDS OF TRANSVERSAL SKILLS

- Technologies: Mechatronics, Energy conservation-Civil Engineering, Digital technologies
- Business, Governance, Responsibilities
- Mountains studies, Tourism, Sport, Health

KEY WORDS

Mechanical engineering ■ Instrumentation ■ Mechatronics ■ Surface metrology ■ Geometric quality ■ Tolerancing ■ Production science ■ Manufacturing science ■ Materials science

SECTORS

- Energy
- Large instruments
- Health
- Manufacturing production

The activities of the SYMME laboratory are mainly focused on innovation for Health and industrial innovation. As the products are getting more and more complex, leading production processes to their limits, the SYMME laboratory is organized to provide an overview on the added value of the product and to consider the overall optimization of its value chain.

RESEARCH THEMES

The research at SYMME is articulated around 4 main axes:

1. Materials and tools for health (axis 1)

- Assistance au geste et au diagnostic
- Nanocristaux multifonctionnels pour l'imagerie et le diagnostic
- Surveillance de l'environnement

2. Materials and systems for energy (axis 2)

- New routes to electroactive materials
- Microsources for energy

3. Innovation in industrial and mechatronical systems (axis 3)

- Control and optimization of systems
- Product life cycle management

4. Functional and aesthetic quality of products (axis 4)

- Qualité d'aspect des produits
- Qualité géométrique d'un produit
- Mise en forme des matériaux

• Two cross-disciplinary programmes

- Thermodynamics of materials (axes 1 and 2)
- Design and optimization of structures (axes 1, 2, 3 and 4)

KEY DATA*

44 professors and researchers
5 administrative and technical staff
28 PhD students

* Academic year 2017-2018

SPECIFIC EQUIPMENT AND EXPERTISE

Engineering skills for interdisciplinary studies on a complex material or product, for example, for:

- its manufacturing
- the development of specific instrumentation
- the synthesis and characterization of materials
- metrology
- modelling and simulation

Various devices for the development and the characterization of materials and systems such as:

- triaxial accelerometer, laser vibrometer, network analyzer ...
- microscopes, calorimeters, DLS, XRD, optical characterizations ...
- determination of 2D and 3D deformations through image analysis, infrared thermal imager

PHD STUDENTS SKILLS

Instrumentation ■ Modelling of multi-physics systems ■ Synthesis/characterization of materials ■ Modelling of the behaviour of components materials (model development, parameter identification) ■ Finite element method simulation ■ Modelling of complex industrial processes ■ Process optimization ■ Surface metrology ■ Quality of products and of processes ■ Management of inter-and multi-disciplinary projects, training, writing of articles in English, scientific watch

NETWORKS / PARTNERSHIPS

Academic cooperations

École Polytechnique Fédérale de Lausanne (Switzerland) ■ Norwegian University of Science and Technology, Trondheim, SIMLab (Norway) ■ Trinity College Dublin (Ireland) ■ Microengineering Laboratory for MEMS, Université de Sherbrooke (Canada)...

Institutional cooperations

Competitiveness clusters: Arve Industries, Plastipolis, Minalogic ■ Technical Centers: CETIM et CTDec ■ MIND ■ Innovation Networks: Thésame, CRITT, Savoie Technolac

Industrial cooperations

NTN-SNR ■ Groupe SEB ■ Schneider Electric ■ Piezotech ■ Fournier ■ ST Dupont ■ Eudica

INTERNATIONAL RELATIONS

Research exchanges: we welcome visiting foreign PhD students and colleagues (Ireland, Norway, Ukraine, Algeria, Senegal,Tunisia..) and SYMME members are welcome by foreign laboratories (China, Canada, USA, Ireland, Germany...) ■ Involvement in European projects (Namdiatream) ■ French leader of INTERREG projects (Naomi, Clovis, Dasuva) involving Swiss academic partners (University of Geneva, EPFL, HEPIA) and Swiss companies

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SYMME

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