

## **The EU-RISE Project CREATE-Network - Composites for Resource-Efficient Applications and Technologies**

Flavio Soldera<sup>1</sup>, Sebastian Suarez<sup>1</sup>, Frank Mücklich<sup>1,2</sup>, Dominik Britz<sup>2</sup>, Silvia Simison<sup>3</sup>, Sonia Brühl<sup>4</sup>, José Luis García<sup>5</sup>, Emilio Jiménez Piqué<sup>6</sup>, Mike Reece<sup>7</sup>, Haroldo Cavalcanti Pinto<sup>8</sup>, Itzhak Green<sup>9</sup>, C. Carrasco<sup>10</sup>, Esteban Ramos Moore<sup>11</sup>, Martin Duarte Guigou<sup>12</sup>, Mkhulu Kenny Mathe<sup>13</sup>

<sup>1</sup> Department Materials Science and Engineering, Saarland University, Saarbrücken, Germany

<sup>2</sup> Materials Engineering Center Saarland, Saarbrücken, Germany

<sup>3</sup> Instituto de Investigaciones en Ciencia y Tecnología de Materiales, Mar del Plata, Argentina

<sup>4</sup> Surface Engineering Group, Universidad Tecnológica Nacional, Facultad Regional Concepción del Uruguay, Concepción del Uruguay, Argentina

<sup>7</sup> R&D Materials and Processes, AB Sandvik Coromant, Stockholm, Sweden

<sup>8</sup> CIEFMA, Barcelona Tech, Barcelona, Spain

<sup>9</sup> Nanoforce Ltd., London, UK

<sup>10</sup> Department of Materials Engineering, University of São Paulo, San Carlos, Brazil

<sup>11</sup> Georgia Tech, Atlanta, USA

<sup>12</sup> Departamento Ingeniería de Materiales, Universidad de Concepción, Concepción, Chile

<sup>13</sup> Instituto de Física, Pontificia Universidad Católica de Chile, Santiago 78204, Chile.

<sup>14</sup> Engineering and Technology School, Catholic University of Uruguay, 11600, Montevideo, Uruguay

<sup>15</sup> Materials Science and Manufacturing, Council for Scientific and Industrial Research - CSIR, Pretoria, South Africa

The aim of the EU-RISE project CREATE-Network is to provide a platform for international and intersectoral collaboration between different academic and non-academic institutions in Europe, Latin America, USA and South Africa in the multidisciplinary field of advanced composite materials. The combined expertise of academic and industrial partners should explore novel composite materials with superior properties and performances.

Three German institutions, the Saarland University, Materials Engineering Center Saarland (MECS) and the Leibniz Institute for New Materials (INM) collaborates with two institutions in Argentina, the Instituto de Investigaciones en Ciencia y Tecnología de Materiales (INTEMA) and the Universidad Tecnológica Nacional Facultad Regional Concepción del Uruguay.

Further partners of CREATE-Network are the Barcelona Tech (Spain), AB Sandvik Coromant (Sweden), Nanoforce Ltd.(UK), the Council for Scientific and Industrial Research (CSIR – South Africa), the Universidad Católica de Uruguay, the Universidad de Concepción (Chile); the Pontificia Universidad Católica de Chile, the Universidade de Sao Paulo (Brazil) and the Georgia Institute of Technology (USA).

The network cooperates since 2015 in the field of design, processing and characterization of novel composite materials for resource-efficient applications and environmentally friendly technologies, in particular energy storage, bearings, electrical contacts, and cutting tools.

The expertise of the network includes:

- a) Design by modelling at different scales (e. g. thermodynamic modelling, finite element modelling);
- b) Novel processing methods (e. g. atomic layer deposition, rapid solidification);
- c) Advanced characterization methods (e. g. atom probe tomography);
- d) Processing/characterization of carbon materials, metal matrix composites, ceramic matrix composites as well as functionally graded materials; and
- e) Performance testing for targeted applications (available through special designed testing facilities).

The close involvement of the industrial partners allows transferring the developed concepts of the research exchanges into innovative products in specific industrial areas. The cooperation is based on the exchange of researchers from academy and industry, complemented with network workshops and conferences. Up to now, 32 persons have participated in the exchanges for a total of 63 person-months. 31 peer-review papers were already published.