Emmanuel CINI

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Senior Metallurgist Engineer + R&D Project leader
Materials and Alloys for aerospace, energy and defence

Profile

Materials Science Ph.D. and **Physicist engineer** with **25 years experience** in **top French R&D centers** in **Metallurgy**.

Competencies

✓ **Analyze**, **comprehend** and **model** the **properties** of **materials** to **maximize** their **performances** : from **physical tests** to **numerical simulations** and **prototypes**,
✓ **Perform scientific** and **technical survey, identify state-of-the art technologies**, **capitalize** and **broadcast key information**, set up **internal trainings**,
✓ **Manage pluridisciplinary** teams of technicians, engineers, students, Ph.Ds,
✓ **Build up** and **lead cross-functional projects**,
✓ **Establish** and **develop external collaborations**, either in France, Europe or **worldwide** (**bilingual** in **English**),
✓ **Contribute** to **scientific recognition** through **articles** in **reviews** and **conferences**.

Skills

✓ **Intellectual curiosity**, **assimilative capacity**,
✓ **Search** for **excellence**,
✓ **Formalize** and **link industrial problems** to **scientific topics**,
✓ **Creative thinking** leading to **innovative approaches**,
✓ Fairly **large professional network** and **good communication** with **academic experts**, **capacity** to **challenge them**

Work Experience

2013-2016 **Head of Materials Modeling section** — VRCF, *Aulnoye-Aymeries (59)*
VALLOUREC
✓ Scientific and technical collaborations: both national (CEA/EDF theses) and international (ICAMS, Tubacex),
✓ Leader for cross-functional and pluridisciplinary projects: physics-based and Finite Element Modeling of creep (involving Metallurgy & Numerical Simulations depts), hydrogen embrittlement of chromium martensitic steels (with Corrosion dept),
✓ Certified trainer for Vallourec University: metallurgy seminar, workshops.

2010-2013 **Head of Creep section**
✓ Team manager : 3 tech., 2 ing. + consultants & internships,
✓ In charge of creep machines (100) and tests (quality + internal R&D),
✓ Design of new steel grades for boiler components: used a Figure Of Merit (FOM) approach, created and validated a new « one shot » recristallization test.

2008-2010 **Metallurgy R&D Project leader**
✓ Creep: set up a comparative methodology for exploiting indentation and relaxation tests, screened out strengthening precipitates via Ab Initio methods (partnership with Materials Design Inc.).

2006 **R&D Project leader** — *S^{t} Pierre en Faucigny (74)*
CIME BOCUZE (**PLANSEE** group)
✓ Powder metallurgy, tungsten-based alloys,
✓ Optimized production routes (for better-controlled withdrawal during sintering).

2000-2005 **Project leader** — CRC, *Ugine (73)*
CEZUS (**AREVA** group)
✓ Metallurgy of zirconium-based alloys, from ores to tubes,
✓ Expertise on lubrication for hot extrusion, developped a laboratory press for experimental simulation (CEMEF collaboration), supported Finite Element Modeling of forming processes, performed technical survey,
✓ Followed up projects and external collaborations (eg. SimulForge: 0,5 M€),
✓ Managed a small team (3 p.), supervised a corrosion test line (equipment and procedures).

1997-2000 **Research engineer** — IRSID, *Maizières-les-Metz (57)*
ARCELOR
✓ Physico-chemical modeling of refractories for continuous casting, thermodynamic models for molten steel,
✓ Microstructural characterizations and expertise of defective parts,
✓ Supervised technicians and trainees.

1995-1997 **Research associate** — CEREM, *Grenoble (38)*
CEA
✓ Finalization of doctoral thesis, extension of theoretical part: bibliographic survey on grain refinement phenomena. Completion of Ph.D. at the Institut National Polytechnique de Grenoble (INPG).

Work Experience

1994-1995 **Overseas National Service trainee** *Tsukuba (Japon)*
AIR LIQUIDE ✓ Volunteered for National Service in an industrial research laboratory out of France: non destructive testing of welding beads, comparative study on corrosion behaviour of tubing materials.

1991-1994 **Doctoral research fellow** *Grenoble (38)*
CNES ✓ Experimental part of Ph.D. thesis: exploratory research on the solidification of refractory alloys under microgravity and ultra-high vacuum (50m high drop tube in Grenoble) / theoretical part: thermodynamic analysis of phase transitions through nucleation and spinodal decomposition.

Education

1997 **Institut National Polytechnique de Grenoble** (**INPG**) *Grenoble (38)*
Ph.D. Materials Science and Engineering

1991
Pre-doctoral Diploma Institut National Polytechnique de Grenoble (INPG) *Grenoble (38)*
Materials Science and Engineering

Physicist engineer **École Nationale Supérieure de Physique de Grenoble** (**ENSPG** now **Phelma**)
Materials

1986-1988
Classes Préparatoires **Lycée Descartes** *Tours (37)*
Math'Sup, Math'Spé

Languages

French Mother tongue,
English Bilingual (Cambridge Certificate in Advanced English - Grade A),
German Average spoken,
Italian Average spoken,
Spanish Beginner,
Japanese Beginner.

Communication

Publications More than ten articles in international scientific reviews and proceedings, list available on https://www.researchgate.net/profile/Emmanuel_Cini/timeline

Teaching
✓ In charge of internal training related to *Steels for PowerGen applications-Tubes & Pipes*, as part of the Metallurgy Seminar given at Vallourec Research Center France (VRCF),
✓ Certified trainer for Vallourec University,
✓ Organizer and host of annual meetings dedicated to the applications of numerical modeling at Vallourec, *Materials Modeling Workshops*.

More on…

Materials High temperature mechanical behaviour of steels: creep, tensile-indentation-relaxation tests, recrystallization
Microstructure-properties relationships: characterization and modeling (Abaqus®, Isight®),
Structural analysis of porous materials: development of a calculation model for permeability.

Hot & Cold work Continuous casting, piercing, extrusion, rolling, isostatic compression, sintering, ECAE, lubrication.

Characterization techniques Physical (particle sizing methods, pyrometry...) & Mechanical (indentation, tensile tests…),
Spectro-chemical (SEM-EBSD, TEM-EDS, XR-peak analysis...).

Thermo -dynamics Modeling of metallic alloys (Fe-Ni, Fe-Mn-C-S systems: liquid phase, sub-networks...),
Nucleation, spinodal decomposition (unmixing) of refractory alloys,
Calculation of nucleation enthalpies of binary compounds by Ab Initio methods, DFT (Materials Design Inc.)
-kinetics ThermoCalc®, MatCalc®

Physical -chemistry Study of interactions between metallic and oxyde phases in steelmaking processes (Ceqcsi®, Gemini®):
Wettability, impregnation and corrosion phenomena.