

1. CURRICULUM VITAE

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Academic Curriculum :

- Mathématiques supérieures - Lycée Louis le Grand - Paris (1979-1980)
- Mathématiques spéciales M' - Lycée Louis le Grand - Paris (1980-1981)
- Ecole Polytechnique (1981-84)
- Engineer from Ecole Polytechnique (1984)
- Diploma of advanced studies in History of Science : écoles des hautes études (1984)
 - " P. de La Hire and projective géométrie " (supervisor: E.COUMET)
- Diploma of advanced studies in Solid State physics, Université Joseph Fourier de Grenoble.(1985)
 - "Plastic deformation of Aluminium-Lithium"
- PhD, INPG, (1987): "Fatigue of Al-Li alloys " (supervisor: P.GUYOT)
- 1987 -1988 : post-doc Mc Master University (Canada)
 - . diffusion and interface migration (with G. PURDY et J. KIRKALDY)
 - . recrystallization and fracture in metal matrix composites (with D. EMBURY)
 - . critical current in type II superconductors (with H.J.JENSEN)
- 1988-1992:
 - . Assistant professor at INP-Grenoble
 - .Scientific advisor at Centre de Recherche de Voreppe (Péchiney)

- Habilitation (1992)

-1992-...

- . Full Professor INP-Grenoble –1st class in 1997, Ex. Class in 2003
- . Adjunct Professor McMaster University
- . junior research professor at Institut Universitaire de France (physics) (1992-1997)
- . Senior Research Professor at IUF (2005...) : « Physics and chemistry of structural materials »
- . Scientific advisor at CRV Alcan
- . Scientific advisor at ONERA (Aeronautics)
- . Scientific advisor at EDF (Nuclear reactors)
- . Member of ARCELOR-MITTAL scientific council
- . Member of CEA- DAM scientific council (Defense)
- . Member of CNRS evaluation commission (materials science and mechanics) (2005-2008)
- . Expert with the french funding agency (ANR) and evaluation committee (AERES)

Distinctions :

- Prix PECHINEY de l'Académie des Sciences (1990)
- Fellowship from the MAXWELL foundation (1992)
- Gladden Senior fellowship from the University of Western Australia(1993, 97)
- European prize for materials science and technology (1995)
- European science prize , Korber foundation (1996)
- Prix Bastien Guillet de la SF2M (2000)
- Weinberg Lecture , UBC, Canada (2003)
- Sawamura award from ISIJ , Japan(2006)
- Guimaraes award from ISIJ, Japan (2006)
- Cohen Lectures, Northwestern University (2006)
- D.K.McDonald Lecture, Canada (2007)
- Max Planck Lecture , Germany (2009)
- Médaille d'argent du CNRS (2009)
- Thermec Distinguished Lecturer (2009)
- Elected Member of the European Academy of Sciences (2009)

Medals :

- Chevalier de la légion d'honneur (2010)

Publications

- More than 500 publications, of which more than 300 in international journals, more than 60 invited conferences
- Translations (Ashby and Jones, Engineering Materials 1 and 2)
- Book : J.Philibert, A.Vignes et P .Combrade de « Métallurgie, du matériau au procédé » (Masson-Dunod, 1997)
- Book with M.Ashby et L.Salvo de « Choix des matériaux et des procédés » (Presses Universitaires de Lausanne , 2001)
- Co editor for 5 conference proceedings

Editorial activities

- Referee for Acta.Met, Scripta.Met, J.de physique, Phil.Mag., Physica Status Solidi, Trans AIME, Phys Rev, Phys Rev Lett, Advanced Engineering Materials, ...
- Editorial board of « Journal of computer simulations in materials science »,
- Editorial board of « Advanced Engineering materials »,
- Comité de Lecture de "Matériaux et Techniques"
- Membre of the Board of governors de Acta Materialia

Conferences

- Organising committee and co-editeur de "Dislocation 93"
- Co-Organisation of "Plasticity 95"
- Co-organisation of « simulations and modelling » (EUROMAT 1999)
- Co organisation of the cross disciplinary colloquium « langages Scientifiques » (2000)
- Co-organisation of « Materials and Process selection » (EUROMAT 2001)
- Co-Organisation of “Architected Material” , MRS symposium 2009
- Co-organisation of “Phase Transformations in Metals (PTM 2010)
- Member of the scientific committee of numerous international conferences
- Cà-Organisation of the Summer Scholl CNRS “Architected Materials” (2011)

Coordination of scientific programs

- Coordinator of international relations for the regional project «Damage » (95-98)
- Coordinator of the regional project "Materials Selection " (95-98)
- Coordinator of the CNRS- Industry contract "Aeronautical alloys " (96-99)
- Coordinator of the CNRS-Industry contract « Ti Al » (2000-2004)
- Coordinator of the research program MAPO (acoustic absorbers for engines) (2005-...)
- Coordinator of the theme « materials by design » de MACODEV (2005-2008)
- Coordinator MatePro « Mansart » (2009-...) (Multifunctionnal architected materials)
- Coordinator of CNRS-Industry contract « Architected materials» (2009...)

Reports and contribution to Reports

- « Light Alloys » for the DGA (1992) (French defense department)
- CNRS Prospective report "Matériaux " (1997) (coordinator of the chapter « structural materials »)
- Report for the french academy of sciences « Nuclear materials » (2000) (co author of the chapter on structural materials)
- « Research in Materials Science : a prospective view » (european report, co author of the chapter on structural materials and the chapter on interdisciplinarity) (2001)
- Report for OFTA « Ageing of Materials » (2001-2003), co author of the chapter on metallic materials
- Report on “Metallurgy” for the French academy of science, member of the committee (RST 2010)

Evaluation

- Member of the National University Evaluation Committee CNU (1991-92)
- Member of the CNRS Evaluation committee (Mechanics and Materials) (2004-2008)
- Member of Grenoble International Scientific council (1999-2004)
- Member of CEA visiting committee (2005) « Materials for Future Reactors »
- Member of CEA Scientific advising group DEN (2009-...) “Materials for GenIV program”
- President of the “Scientific Collegium for Materials Science in Grenoble INP” (2009-...)
- President of the Scientific council for the “Materials Ageing Institute” EDF (2010...)

2. TEACHING AND TRAINING OF RESEARCH STUDENTS

I have trained more than 60 PhD's

12 of my former PhD are academics, the others are research engineers in industry.

Teaching

Most of my teaching has been done in Grenoble INP.

- Introduction to materials science (32)
- Materials Selection (32)
- Failure analysis (16)
- Materials Science for microelectronics (16)
- Phase transformations (16)
- Composite materials(16)
- Physical chemistry of materials and nanostructures (10)
- Modelling methods in materials science (32h)
- Structural Biomimetics (8)
- Materials Science and Materials Selection for Nuclear reactors (32)
- Materials Science and Political decisions (Common with Social Sciences) (16)

I have created and directed a 1 year program in "materials for microelectronics" (2001-2005)

I am currently in charge of a joint 1 year - program with EDF , with international perspectives, on "materials science for nuclear engineering" (starting in 2008)

In addition I have developed project based learning in "introduction to research", materials selection" "failure analysis"

I have been giving lectures regularly in other French Universities, and in McMaster University where I am an adjunct professor.

3. RESEARCH ACTIVITIES:

My research is in materials science and more specifically in metallurgy, both for microstructure generation , and for relations microstructure/properties. I am mainly doing modelling in close relation with experimentalists. In addition in the last 10 years I have worked a lot, in collaboration with M.F.Ashby, on design issues. More recently I have been involved in research at the interface between materials science and biology.

- Microstructures ,
 - Phase transformations in metals and alloys : austenite to ferrite transformations, bainite, in steels, precipitations in aluminium alloys, discontinuous precipitation
 - Effect of solute on migrating interfaces,
 - grain growth simulation , effect of confinement
 - Dislocations structures and stability, recovery and recrystallisation kinetics, effect on magnetic properties
 - Coupling plasticity and phase transformations
 - Non isothermal transformations and applications to welding and friction stirr welding.

- Mechanical properties ,
 - Plasticity and work hardening in heterogeneous materials and small grain materials
 - Physically based constitutive equations
 - Dislocation dynamics and plastic instabilities
 - Effect of precipitation on work hardening in light alloys
 - Ductile Fracture mechanisms in Al alloys and duplex steels
 - Intragranular fracture in IF steels
 - Irradiation damage
 - Coupling fracture and environment
 - Mechanics of foamed and entangled materials
 - Acoustic properties of porous materials
 - Architected materials and sandwiches
 - Mechanics of suspensions and semisolid materials

- Materials Selection and design ,
 - Materials selection method for specific issues : polymer based composites, cast alloys, glass composition
 - Process selection : surface treatments, joining methods
 - Value analysis, promising application identification
 - Designing hybrid materials
 - Shape optimisation and materials selection

- Interface with biology ,
 - Cellular adhesion and detachment
 - Protein precipitation and surface interactions
 - Morphogenesis in diatomea
 - Dynamics of trabecular bone
 - Mechanics of collagen
 - Structural biomimetics