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- January 2025:** Elected Secretary-General of the European Mechanics Society Euromech
- January 2024:** Elected President of the Haut Comité de la Mécanique, advisory committee belonging to the AFM (French Association of Mechanics)
- Decembre 2022:** Elected member of the French Academy of Sciences in the section *Mechanical and computer sciences*
- Octobre 2022:** Promotion to DRCE (distinguished research fellow) at CNRS
- April 2016:** Head of the Materials and Structures Simulation group at Centre des Matériaux Mines ParisTech
- January 2015-2019:** Head, together with Prof. F. Dell'Isola, of the CNRS International Associate Lab LIA Coss&Vita on *Mechanics of generalized continua and their applications to engineering materials and structures*, between Paris F2M (France) and Rome MEMOCS (Italy)
- October 2013:** First class Research Director at CNRS (DR1)
- January 2009:** Director of the CNRS Fédération Francilienne de Mécanique des Matériaux, Structures et Procédés (F2M) CNRS FR 2609 (2009-2018)
- January 2007:** Associate Director of the CNRS Fédération Francilienne de Mécanique des Matériaux, Structures et Procédés, which coordinates research activities of 14 laboratories in mechanics and materials in the Paris region (Director: André Zaoui).
- October 2006:** Research Director at CNRS
- October 2004:** Continuum Mechanics Professor at Ecole des Mines de Paris. The course is part of a general e-learning project in Mechanics of Materials and Structures mms2.ensmp.fr (module MMC Paris).
- November 2004:** Habilitation delivered by the University Pierre et Marie Curie, (jury : D. Leguillon, P. Ponte-Castaneda, P. Suquet, E. Busso, G. Cailletaud, G. Maugin, F. Sidoroff).
- June-July 2003 / February 2004 :** Stays at the Institut für Theoretische Physik, TU Berlin, and at the Weierstrass Institut für Angewandte Analysis und Stochastik (WIAS), with Prof. W. Dreyer, Berlin (RFA).

October 1996: Chargé de Recherches at CNRS UMR 7633; research program :

*“Modelling the behaviour of heterogeneous materials
within the framework of the mechanics of generalized continua”.*

January 1996: Doctor of l'Ecole des Mines de Paris and Doctor Communitatis Europae, in Materials Sciences and Engineering, with distinction (mention Très Honorable et Félicitations du Jury). Jury: A. Bertram, R. de Borst, G. Cailletaud, P. Pilvin, P. Rougée, F. Sidoroff, E. Stein, C. Teodosiu, A. Zaoui; Thesis advisor : G. Cailletaud (Centre des Matériaux). Title of the doctoral thesis :
“Mechanical modelling of heterogeneous deformation of single crystals”

1994-1995: One-year stay at Bundesanstalt für Materialforschung und Prüfung (BAM, Berlin, RFA) within the framework of BRITE-EURAM Project BRE2-CT92-0176 on *Development of Microstructure Based Viscoplastic Models for an Advanced Design of Single Crystal Hot Section Components*

June 1993: Diplôme d'Études Approfondies “*Materials Mechanics*” (post-graduate studies).

June 1992: Diplôme d'Ingénieur Civil des Mines de Paris, (with distinction).

1989-1992: Student at l'Ecole des Mines de Paris (ENSMP), with a major in “*Materials Sciences and Engineering*”.

1986-1989: Preparatory Classes intended for a path of study at the Grandes Ecoles (Mathematics, Physics), in Lyons.

June 1986: Baccalaureat C in Villefranche/Saône

Awards

Arpad L. Nadai Medal of The American Society of Mechanical Engineers (ASME, USA, 2026)

<https://www.asme.org/about-asme/honors-awards/achievement-awards/nadai-medal>

William Prager Medal of the Society of Engineering Science (SES, USA, 2026)

<https://socengsci.org/prager-medal/>

Huy Duong Bui prize of the Académie des Sciences for the year 2021 (annual prize in mechanics, IT or astrophysics)

www.academie-sciences.fr/fr/Laureats/laureat-2021-du-grand-prix-huy-duong-bui-samuel-forest.html

fr.wikipedia.org/wiki/Prix_Huy_Duong_Bui

www.academie-sciences.fr/fr/Prix-en-mathematiques-physique-mecanique-informatique-et-sciences-de-la-Terre-et-de-l-univers/prix-huy-duong-bui.html

www.academie-sciences.fr/fr/Laureats/laureats-2021-prix-academie-des-sciences.html

Elected Solid Mechanics Euromech Fellow of the European Mechanics Society, 2017

<https://euromech.org/fellows/euromech-fellows-solids>

CNRS Silver Medal, 2012

www.cnrs.fr/fr/personne/samuel-forest

Jean Morlet Prize 2008 of the Société Française de Métallurgie et Matériaux (given every two years)

Plumey prize of the Académie des Sciences for the year 2007

Jean Mandel Prize for the year 2001

https://fr.wikipedia.org/wiki/Jean_Mandel

The study “Mechanical behaviour of nickel foams” by Xavier Badiche, M. Croset, S. Forest and Y. Bienvenu has received the price Jules Garnier of Société Française de Métallurgie for 1999

CNRS Bronze Medal for 1998

Editorships

Associate Editor of the *Journal of the Mechanics and Physics of Solids* (2025-...)

Member of the editorial board (2023-2024) and Editor-in-Chief (since 2024) of the *Comptes Rendus Mécanique* of the Académie des Sciences

Member of the advisory board of the *European Journal of Mechanics A/Solids* (since 2022)

Member of the editorial board of the *Archives of Mechanics* (since 2020)

Member of the editorial board of the *GAMM Mitteilungen* (since 2019)

Associate Editor of the *International Journal of Solids and Structures* (2017-2024)

Member of the editorial board of the *International Journal of Solids and Structures* (since 2013-2016)

Member of the editorial board of *Technische Mechanik* (since 2012)

Member of the editorial committee of *Continuum Mechanics and Thermodynamics* (since 2010)

Member of the editorial committee of *Archive of Applied Mechanics* (since 2008)

Associate Editor (2007-2023) and member of the Advisory Board (2023-...) of the *Philosophical Magazine*

List of Publications and Research/Teaching Activities

1 Publications

Journals

- [1] A. Dziri, K. Ammar, S. Forest, H. Proudhon, Q. Sirvin, T. Richeton, and D. Texier. Effect of oxygen content on elastic properties of an oxygen-graded titanium: Experimental and computational analyses. *Materials & Design*, 259:114801, 2025.
- [2] S.C. Ren, T.F. Morgeneyer, G. Rousselier, M. Mazière, and S. Forest. Re-straining induced triggering of Portevin-Le Chatelier effect in recrystallized 2198 T3 and T8 aluminium alloy: Experimental observations and FE simulations for smooth and notched samples. *International Journal of Solids and Structures*, 323:113636, 2025.
- [3] Victor de Rancourt, Kais Ammar, Benoit Appolaire, and Samuel Forest. Viscoplasticity and phase field modelling of the delayed cracking of oxide intrusions at grain boundaries. *Journal of the Mechanics and Physics of Solids*, 205:106300, 2025.
- [4] Yaovi Armand Amouzou-Adoun, Mohamed Abatour, Mohamed Jebahi, Samuel Forest, and Marc Fivel. Enhanced plastic distortion based micromorphic model for flexible control of scaling effects. *International Journal of Solids and Structures*, 322:113568, 2025.
- [5] Houssem Eddine Chaieb, Vincent Maurel, Samuel Forest, Kais Ammar, Franck Nozahic, Joost De Strycker, Jean-Michel Maigne, Alexandre Tanguy, and Eva Heripré. In-situ characterization of the mechanical behavior of hot-dip Zn-5Al coating: An overview of deformation and damage mechanisms. *Corrosion Science and Technology*, 24:86–95, 2025.
- [6] M. Lamari, P. Kerfriden, O. U. Salman, V. Yastrebov, K. Ammar, and S. Forest. A time-discontinuous elasto-plasticity formalism to simulate instantaneous plastic flow bursts. *International Journal of Solids and Structures*, 309:113171, 2025.
- [7] A. Zouari, M. Bengoetxea-Aristondo, F. Siska, A. Bouzid, F. Gaslain, A. Chopin, H. E. Chaieb, K. Ammar, P. Bertho, J. De Strycker, J.-M. Maigne, and S. Forest. Experimental and digital twinning in ZnAlMg coatings. *Mechanics of Materials*, 199:105173, 2024.
- [8] Y. A. Amouzou-Adoun, M. Jebahi, S. Forest, and M. Fivel. Advanced modeling of higher-order kinematic hardening in strain gradient crystal plasticity based on discrete dislocation dynamics. *Journal of the Mechanics and Physics of Solids*, 193:105875, 2024.
- [9] M. Abatour, K. Ammar, S. Forest, C. Ovalle-Rodas, N. Osipov, and S. Quilici. A generic formulation of anisotropic thermo-elastoviscoplasticity at finite deformations for Finite Element codes. *Computational Mechanics*, 2024.
- [10] F. Billon, S. Zambelli, M. Al Kotob, A. Vattré, M. Mazière, and S. Forest. Experimental vs numerical spatio-temporal analysis of the Portevin-Le Chatelier dynamics in a nickel based superalloy. *in preparation*, 2025.
- [11] N. Klavzer, M. Abatour, J. Chevalier, S. Forest, and Th. Pardoën. Modelling of size-dependent plasticity in polymer-based composites based on nano- and macroscale experimental results. *Composites Part A: Applied Science and Manufacturing*, 185:108309, 2024.
- [12] M. Bengoetxea Aristondo, K. Ammar, S. Forest, V. Maurel, and J. M. Maigne H. E. Chaieb. Phase-field modelling of zinc dendrite growth in znalmg coatings. *Corrosion Science and Technology*, 23:93–103, 2024.

- [13] F. Ghiglione, A. Ask, K. Ammar, B. Appolaire, and S. Forest. Cosserat-phase-field modeling of grain nucleation in plastically deformed single crystals. *Journal of the Mechanics and Physics of Solids*, 187:105628, 2024.
- [14] V. Phalke, S. Forest, H. J. Chang, T. Rose, and A. Roos. Dark energy in crystals: prediction of stored energy in polycrystalline aggregates. *Journal of Materials Science*, 59:5201–5232, 2024.
- [15] C. Cadet, S. Flouriot, S. Forest, P. Kerfriden, and V. de Rancourt. Surrogate modeling by multifidelity cokriging for the ductile failure of random microstructures. *Computational Mechanics*, 74:225–245, 2024.
- [16] H. E. Chaieb, V. Maurel, K. Ammar, S. Forest, A. Tanguy, E. Héripré, F. Nozahic, J.-M. Mategne, and J. De Strycker. In-situ localization of damage in a Zn-Al-Mg coating deposited on steel by continuous hot-dip galvanizing. *Scripta Materialia*, 243:115960, 2024.
- [17] K. Ammar, S. Forest, H. Ben Kahla, D. Mereib, and M. Laurent-Brocq. Unravelling the extra-hardening in chemically architected high entropy alloys. *Computational Materials Science*, 233:112714, 2024.
- [18] M. Fergoug, A. Parret-Fréaud, N. Feld, B. Marchand, and S. Forest. Hierarchical modeling of heterogeneous structures driven by a modeling error estimator. *Computer Methods in Applied Mechanics and Engineering*, 418:116529, 2024.
- [19] S. Forest and A. Miranville. A Cahn-Hilliard model based on microconcentrations. *Mediterranean Journal of Mathematics*, 20, 2023.
- [20] M. Abatour and S. Forest. Strain gradient plasticity based on saturating variables. *European Journal of Mechanics - A/Solids*, 104:105016, 2024.
- [21] Y. A. Amouzou-Adoun, M. Jebahi, M. Fivel, S. Forest, J.-S. Lecomte, C. Schuman, and F. Abed-Meraim. On elastic gaps in strain gradient plasticity: 3D discrete dislocation dynamics investigation. *Acta Materialia*, 252:118920, 2023.
- [22] M. Jebahi and S. Forest. An alternative way to describe thermodynamically-consistent higher-order dissipation within strain gradient plasticity. *Journal of the Mechanics and Physics of Solids*, 170:105103, 2023.
- [23] N. Guillermin, J. Besson, A. Köster, L. Lacourt, M. Mazière, H. Chalons, and S. Forest. Experimental and numerical analysis of the Portevin-Le Chatelier effect in a nickel-base superalloy for turbine disks application. *International Journal of Solids and Structures*, 264:112076, 2023.
- [24] M. Abatour, S. Forest, K. Ammar, C. Ovalle, N. Osipov, and S. Quilici. Toward robust scalar-based gradient plasticity modeling and simulation at finite deformations. *Acta Mechanica*, 234:911–958, 2023.
- [25] M. Fergoug, A. Parret-Fréaud, N. Feld, B. Marchand, and S. Forest. Multiscale analysis of composite structures based on higher-order asymptotic homogenization with boundary layer correction. *European Journal of Mechanics - A/Solids*, 96:104754, 2022.
- [26] C. Cadet, J. Besson, S. Flouriot, S. Forest, P. Kerfriden, L. Lacourt, and V. de Rancourt. Strain localization analysis in materials containing randomly distributed voids: Competition between extension and shear failure modes. *Journal of the Mechanics and Physics of Solids*, 166:104933, 2022.
- [27] V. Phalke, S. Forest, H.-J. Chang, and A. Roos. Adiabatic shear banding in FCC metallic single and poly-crystals using a micromorphic crystal plasticity approach. *Mechanics of Materials*, 169:104288, 2022.

- [28] R. Russo, V. Phalke, D. Croizet, M. Ziane, S. Forest, F.A. Girot Mata, H.J. Chang, and A. Roos. Regularization of shear banding and prediction of size effects in manufacturing operations: A micromorphic plasticity explicit scheme. *International Journal of Material Forming*, 15:21, 2022.
- [29] F. Ghiglione and S. Forest. On the torsion of isotropic elastoplastic Cosserat circular cylinders. *Journal of Micromechanics and Molecular Physics*, 7:3–16, 2022.
- [30] M. Fergoug, A. Parret–Fréaud, and S. Forest N. Feld, B. Marchand. A general boundary layer corrector for the asymptotic homogenization of elastic linear composite structures. *Composite Structures*, 285:115091, 2022.
- [31] M. Abatour, K. Ammar, S. Forest, C. Ovalle-Rodas, N. Osipov, and S. Quilici. A generic formulation of anisotropic thermo-elastoviscoplasticity at finite deformations for Finite Element codes. hal.archives-ouvertes.fr/hal-03462216v2, 2021.
- [32] G. Trego, J.C. Brachet, V. Vandenberghe, L. Portier, L. Gélébart, R. Chosson, J. Soulacroix, S. Forest, and A.F. Gourgues-Lorenzon. Influence of grain size on the high-temperature creep behaviour of M5 zirconium alloy under vacuum. *Journal of Nuclear Materials*, 560:153503, 2022.
- [33] M. Lindroos, J.-M. Scherer, S. Forest, A. Laukkanen, T. Andersson, J. Vaara, A. Mäntylä, and T. Frondelius. Micromorphic crystal plasticity approach to damage regularization and size effects in martensitic steels. *International Journal of Plasticity*, 151:103187, 2022.
- [34] T. Pinomaa, M. Lindroos, P. Jreidini, M. Haapalehto, K. Ammar, L. Wang, S. Forest, N. Provatas, and A. Laukkanen. Multiscale analysis of crystalline defect formation in rapid solidification of pure aluminium and aluminium-copper alloys. *Phil. Trans. R. Soc. A*, 380:20200319, 2022.
- [35] M. Lindroos, T. Pinomaa, K. Ammar, A. Laukkanen, N. Provatas, and S. Forest. Dislocation density in cellular rapid solidification using phase field modeling and crystal plasticity. *International Journal of Plasticity*, 148:103139, 2022.
- [36] K. Ammar, B. Appolaire, and S. Forest. Splitting of dissolving precipitates during plastic shear: A phase field study. *Comptes Rendus. Physique*, 22:353–370, 2021.
- [37] V. Phalke, T. Kaiser, J. M. Scherer, and S. Forest. Modeling size effects in microwire torsion: A comparison between a lagrange multiplier-based and a CurlFP gradient crystal plasticity model. *European Journal of Mechanics A/Solids*, 94:104550, 2021.
- [38] J.M. Scherer, J. Besson, S. Forest, J. Hure, and B. Tanguy. A strain gradient plasticity model of porous single crystal ductile fracture. *Journal of the Mechanics and Physics of Solids*, 156:104606, 2021.
- [39] H. Farooq, D. Ryckelynck, S. Forest, G. Cailletaud, and A. Marano. A pruning algorithm preserving modeling capabilities for polycrystalline data. *Computational Mechanics*, 68:1407–1419, 2021.
- [40] S. D. Schmidt, K. Ammar, W. Dornisch, S. Forest, and R. Müller. Phase field model for the martensitic transformation: comparison of the Voigt/Taylor and Khachaturyan approach. *Continuum Mechanics and Thermodynamics*, 33:2075–2094, 2021.
- [41] M. Mazière, S. Forest, and A. Mortensen. Finite element simulation of the Portevin–Le Chatelier effect in highly reinforced metal matrix composites. *Philosophical Magazine*, 101:1471–1489, 2021.
- [42] C. Cadet, J. Besson, S. Flouriot, S. Forest, P. Kerfriden, and V. de Rancourt. Ductile fracture of materials with randomly distributed defects. *International Journal of Fracture*, 230:193–223, 2021.

- [43] D. Colas, E. Finot, S. Flouriot, S. Forest, M. Mazière, and T. Paris. Experimental and computational approach to fatigue behavior of polycrystalline tantalum. *Metals*, 11:416, 2021.
- [44] M. Jebahi and S. Forest. Scalar-based strain gradient plasticity theory to model size-dependent kinematic hardening effects. *Continuum Mechanics and Thermodynamics*, 33:1223–1245, 2021.
- [45] B. Staber, S. Forest, M. Al Kotob, M. Mazière, and T. Rose. Loss of ellipticity analysis in non-smooth plasticity. *International Journal of Solids and Structures*, 222–223:111010, 2021.
- [46] A. Marano, L. Gélébart, and S. Forest. FFT-based simulations of slip and kink bands formation in 3D polycrystals: influence of strain gradient crystal plasticity. *Journal of the Mechanics and Physics of Solids*, 149:104295, 2021.
- [47] S. C. Ren, T. F. Morgeneyer, M. Mazière, S. Forest, and G. Rousselier. Effect of Lüders and Portevin-Le Chatelier localization bands on plasticity and fracture of notched steel specimens studied by DIC and FE simulations. *International Journal of Plasticity*, 136:102880, 2020.
- [48] R. Russo, F. A. Girot Mata, and S. Forest. Thermomechanics of cosserat medium: Modeling adiabatic shear bands in metals. *Continuum Mechanics and Thermodynamics*, 35:919–938, 2023.
- [49] J. M. Scherer, V. Phalke, J. Besson, S. Forest, J. Hure, and B. Tanguy. Lagrange multiplier based vs micromorphic gradient-enhanced rate-(in)dependent crystal plasticity modelling and simulation. *Computer Methods in Applied Mechanics and Engineering*, 372:113426, 2020.
- [50] T. Kaiser, S. Forest, and A. Menzel. A finite element implementation of the stress gradient theory. *Meccanica*, 56:1109–1128, 2021.
- [51] R. Russo, F.A. Girot Mata, S. Forest, and D. Jacquin. A review on strain gradient plasticity approaches in simulation of manufacturing processes. *J. Manuf. Mater. Process.*, 4:87, 2020.
- [52] L. T. Le, K. Ammar, and S. Forest. Efficient simulation of single and poly-crystal plasticity based on the pencil glide mechanism. *Comptes Rendus Mécanique*, 348:846–876, 2020.
- [53] A.-E. Viard, J. Dirrenberger, and S. Forest. Propagating material instabilities in planar architected materials. *International Journal of Solids and Structures*, 202:532–551, 2020.
- [54] S. Forest and K. Sab. Finite-deformation second-order micromorphic theory and its relations to strain and stress gradient models. *Mathematics and Mechanics of Solids*, 25:1429–1449, 2020.
- [55] A. Ask, S. Forest, B. Appolaire, and K. Ammar. Microstructure evolution in deformed polycrystals predicted by a diffuse interface Cosserat approach. *Advanced Modeling and Simulation in Engineering Sciences*, 7(9), 2020.
- [56] C. Findeisen, S. Forest, J. Hohe, and P. Gumbsch. Discrete and continuum modelling of size effects in architected unstable metamaterials. *Continuum Mechanics and Thermodynamics*, 32:1629–1645, 2020.
- [57] L. Lacourt, D. Ryckelynck, S. Forest, V. de Rancourt, and S. Flouriot. Hyper-reduced direct numerical simulation of voids in welded joints via image-based modeling. *International Journal for Numerical Methods in Engineering*, 121:2581–2599, 2020.
- [58] M. B. Rubin and S. Forest. Analysis of material instability of a smooth elastic-inelastic transition model. *International Journal of Solids and Structures*, 193–194:39–53, 2020.
- [59] M. Ryš, S. Forest, and H. Petryk. A micromorphic crystal plasticity model with the gradient-enhanced incremental hardening law. *International Journal of Plasticity*, 128:102655, 2020.
- [60] H. Farooq, G. Cailletaud, S. Forest, and D. Ryckelynck. Crystal plasticity modeling of the cyclic behavior of polycrystalline aggregates under non-symmetric uniaxial loading: Global and local analyses. *International Journal of Plasticity*, 126:102619, 2019.

- [61] S. Forest. Continuum thermomechanics of nonlinear micromorphic, strain and stress gradient media. *Philosophical Transactions A*, 378:20190169, 2020.
- [62] M. Al Kotob, C. Combescure, M. Mazière, T. Rose, and S. Forest. A general and efficient multi-start algorithm for the detection of loss of ellipticity in elastoplastic structures. *International Journal for Numerical Methods in Engineering*, 121:842–866, 2019.
- [63] G. Hütter, K. Sab, and S. Forest. Kinematics and constitutive relations in the stress–gradient theory: Interpretation by homogenization. *International Journal of Solids and Structures*, 193–194:90–97, 2020.
- [64] A. Marano, L. Gélébart, and S. Forest. Intragranular localization induced by softening crystal plasticity: Analysis of slip and kink bands localization modes from high resolution FFT-simulations results. *Acta Materialia*, 15:262–275, 2019.
- [65] D. Colas, E. Finot, S. Flouriot, S. Forest, M. Mazière, and T. Paris. Local ratcheting phenomena in the cyclic behavior of polycrystalline tantalum. *JOM Journal of the Minerals, Metals & Materials Society*, 71:2586–2599, 2019.
- [66] T. Gu, J.-R. Medy, V. Klosek, O. Castelnau, S. Forest, E. Hervé-Luanco, F. Lecouturier-Dupouy, H. Proudhon, P.-O. Renault, L. Thilly, and P. Villechaise. Multiscale modeling of the elastoplastic behavior of architected and nanostructured Cu-Nb composite wires and comparison with neutron diffraction experiments. *International Journal of Plasticity*, 122:1–30, 2019.
- [67] J. M. Scherer, J. Besson, S. Forest, J. Hure, and B. Tanguy. Strain gradient crystal plasticity with evolving length scale: Application to voided irradiated materials. *European Journal of Mechanics - A/Solids*, 77:103768, 2019.
- [68] Z.-P. Wang, L.-H. Poh, Y. Zhu, J. Dirrenberger, and S. Forest. Systematic design of tetra-petals auxetic structures with stiffness constraint. *Materials & Design*, 170:107669, 2019.
- [69] S. C. Ren, T. F. Morgeneyer, M. Mazière, S. Forest, and G. Rousselier. Portevin-Le Chatelier effect triggered by complex loading paths in an Al-Cu aluminium alloy. *Philosophical Magazine*, 99:659–678, 2019.
- [70] H. Proudhon, N. Guéninchault, S. Forest, and W. Ludwig. Incipient bulk polycrystal plasticity observed by synchrotron in-situ topotomography. *Materials*, 11:1–18, 2018.
- [71] A. Ask, S. Forest, B. Appolaire, and K. Ammar. Cosserat crystal plasticity with dislocation–driven grain boundary migration. *Journal of Micromechanics and Molecular Physics*, 3:1840009, 2018.
- [72] A. Ask, S. Forest, B. Appolaire, and K. Ammar. A Cosserat–phase field theory of crystal plasticity and grain boundary migration at finite deformation. *Continuum Mechanics and Thermodynamics*, 31:1109–1141, 2019.
- [73] A. Ask, S. Forest, B. Appolaire, K. Ammar, and O. U. Salman. A Cosserat crystal plasticity and phase field theory for grain boundary migration. *Journal of the Mechanics and Physics of Solids*, 115:167–194, 2018.
- [74] C. Ling, S. Forest, J. Besson, B. Tanguy, and F. Latourte. A reduced micromorphic single crystal plasticity model at finite deformations. Application to strain localization and void growth in ductile metals. *International Journal of Solids and Structures*, 134:43–69, 2018.
- [75] F. Ebobisse, P. Neff, and S. Forest. Well-posedness for the microcurl model in both single and polycrystal gradient plasticity. *International Journal of Plasticity*, 107:1–26, 2018.
- [76] S. Ren, M. Mazière, S. Forest, T. F. Morgeneyer, and G. Rousselier. A constitutive model accounting for strain ageing effects on work-hardening. Application to a C–Mn steel. *Comptes Rendus Mécanique*, 345:908–921, 2017.

- [77] T. Gu, J.-R. Medy, F. Volpi, O. Castelnau, S. Forest, E. Hervé-Luanco, F. Lecouturier, H. Proudhon, P.-O. Renault, and L. Thilly. Multiscale modeling of the anisotropic electrical conductivity of architected and nanostructured Cu-Nb composite wires and experimental comparison. *Acta Materialia*, 141:131–141, 2017.
- [78] A. Pineau and S. Forest. Effects of inclusions on the very high cycle fatigue behaviour of steels. *Fatigue & Fracture of Engineering Materials & Structures*, 40:1694–1707, 2017.
- [79] T. Gu, O. Castelnau, S. Forest, E. Hervé-Luanco, F. Lecouturier, H. Proudhon, and L. Thilly. Multiscale modeling of the elastic behavior of architected and nanostructured Cu–Nb composite wires. *International Journal of Solids and Structures*, 121:148–162, 2017.
- [80] W. Liu, K. Saanouni, S. Forest, and P. Hu. The micromorphic approach to generalized heat equations. *Journal of Non-Equilibrium Thermodynamics*, 42:327–357, 2017.
- [81] Z. P. Wang, L. H. Poh, J. Dirrenberger, Y. Zhu, and S. Forest. Isogeometric shape optimization of smoothed petal auxetic structures via computational periodic homogenization. *Computer Methods in Applied Mechanics and Engineering*, 323:250–271, 2017.
- [82] C. Ling, B. Tanguy, J. Besson, S. Forest, and F. Latourte. Void growth and coalescence in triaxial stress fields in irradiated FCC single crystals. *Journal of Nuclear Materials*, 492:157–170, 2017.
- [83] G. Rousselier, T. F. Morgeneyer, S. C. Ren, M. Mazière, and S. Forest. Interaction of the Portevin–Le Chatelier phenomenon with ductile fracture of a thin aluminum ct specimen: experiments and simulations. *International Journal of Fracture*, 206:95–122, 2017.
- [84] H. Proudhon, J. Li, W. Ludwig, A. Roos, and S. Forest. Simulation of short fatigue crack propagation in a 3D experimental microstructure. *Advanced Engineering Materials*, pages 1600721–n/a, 2017.
- [85] M. Horák, D. Ryckelynck, and S. Forest. Hyper–reduction of generalized continua. *Computational Mechanics*, 59:753–778, 2017.
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- [430] J. Ziebs, J. Bressers, H. Frenz, D.R. Hayhurst, H. Klingelhöffer, and S. Forest. *Proceedings of the International Symposium on Local strain and temperature measurements in non-uniform fields at elevated temperatures, Berlin*. Woodhead Publishing Limited, 1996.

2 Organisation of international conferences

Co-chair of the 12th Euromech Solid Mechanics Conference, ESMC 2025, Eric Maire chair, Lyon, 1330 participants, 7-11 July 2025.

Co-organiser with D. McDowell, S. Müller and E. Werner of the 2024 Oberwolfach Workshop on Mechanics of Materials, *Multiscale design of advanced materials and structures*, Mathematisches Forschungsinstitut Oberwolfach, MFO, Germany, 3-8 March 2024.

Co-organiser with P. Podio-Guidugli, L. Truskinovsky and R. Zarkone of the *57th of the Society for Natural Philosophy*, supported by three PSL schools (ENS d'architecture de Paris, ESPCI, Mines Paris) with sessions dedicated to the memory of Gianfranco Capriz and Maurizio Brocato, Amphithéâtre d'honneur de l'Ecol des Beaux-Arts, Paris 16-18 octobre 2023.

Co-organiser with J. Segurado and J. Marian of a Mini-Symposium at the 17th International Conference on Computational Plasticity on *Plasticity and damage at the microscale* at COMPLAS, 5-7 September 2023, Barcelona, Spain.

Co-chair of CMDS14, the 14th International Symposium on Continuum and Discrete Systems, organized by J. Dirrenberger, S. Forest, D. Jeulin and W. Willot at CNAM, Paris, 26-30 June 2023. cmds14.org

Organisation of the IUTAM Symposium on *Generalized continua emerging from microstructures*, a hybrid conference, Paris, 19–23 July 2021. <https://iutam-2021-gc.sciencesconf.org>

Organiser with F. Willot of the international workshop in honor and in the presence of Dominique Jeulin, *Physics and mechanics of random structures: from morphology to material properties* île d'Oléron, France, June 17–22, 2018.

Organiser of a Symposium at the 15th Euromech Mechanics of Materials Conference *Higher order continua* at EMMC 2016, Bruxelles, Belgique, Septembre 7–9, 2016, and EMMC 16 in Nantes, 25–28 March 2018.

Co-organiser with C. Niordson of a Thematic Session on *Sizescale Effects in Materials* at ICTAM 2016, Montréal, Canada, August 21–26, 2016.

Co-organiser with H. Altenbach of the third advanced seminar on *Generalized continua as models for materials with multi-scale effects or under multi-field actions*, Otto-von-Guericke Universität Magdeburg, Septembre 21–25, 2015.

Co-organiser with C. Miehe and C. Linder of a mini-symposium dedicated to *Microstructural Based Constitutive Models in Hard and Soft Matter Materials* within the 11th. World Congress on Computational Mechanics (WCCM XI), Barcelona, 20–25 July 2014.

Co-organiser with F. dell’Isola of the Euromech Colloquium 563 on *Generalized continua and their application to the design of composites and metamaterials*, M&MOCS, Research Center on Mathematics and Mechanics of Complex Systems, Università degli Studi dell’Aquila, Cisterna di Latina, Italy, March 17–21 2014.

Co-organizer with H. Altenbach and A. Krivtsov of the second trilateral Russian–German–French seminar on *Generalized continua as models for materials with multi-scale effects or under multi-field actions*, sponsored by CNRS–DFG–FRRF agencies, Leucorea, Lutherstadt–Wittenberg, Germany, 26–30th September, 2012.

Co-organizer with K. Sab of the Mini-Symposium, *Numerical simulation of microstructures* at ECCOMAS 2012, 6th European Congress of Computational Methods in Applied Sciences and Engineering, organized by J. Eberhardsteiner, H.J. Böhm, F.G. Rammerstorfer, Vienna, Austria, September 10–14, 2012.

Co-organizer with B. Markert of the Symposium, *Trends in phase field modeling* at the 8th European Solid Mechanics Conference, Graz, Austria, Juli 9–13, 2012.

Organizer of the Symposium, *New perspectives in numerical modeling of mechanical behaviour of materials* at the International Conference on the Mechanical Behavior of Materials, Como, Italy, June 5–9 2011.

Co-organizer of the CNRS Summer School on *Archimat, Architected materials*, with R. Dendievel and Y. Bréchet, Autrans, 22–28 May, 2011.

Co-organizer of the CNRS Summer School on *Mechanics of Nano-Objects*, Autrans, March 14–19, 2010, emanating from the CNRS GDR Mécano.

17th International Workshop on Computational Mechanics of Materials, IWCMM17, organized by G. Cailletaud, S. Forest and S. Schmauder, Paris, 22–24th august 2007.

11th International Symposium on Continuum Models and Discrete Systems, CMDS11, organized by D. Jeulin, member of the organizing and scientific committees, Paris, 30 july–3 august 2007.

Scale transitions from atomistics to continuum plasticity, 5th Euromech–Mécamat European Mechanics of Materials Conference, EMMC5, Delft, The Netherlands, 5–8 march 2001, *J. Phys. IV*, Vol. 11, Pr. 5, 2001.

Heterogeneous materials and generalized continua : mini-symposium of ESMC4 (Fourth Euromech Solid Mechanics Conference), organized with Dr. R. Sievert (BAM - Berlin) : 10 oral presentations + 15 posters, Metz, june 2000.

Porous materials and foams : material processing, structure and properties, symposium organized by Y. Bienvenu, P. Bompard and S. Forest at Journées d’Automne de la SF2M, Paris, 1998.

Member of Organization committee of the 2nd European Mechanics of Materials Conference on Mechanics of Materials with Intrinsic Length Scale, EMMC2, Magdeburg, Germany, 23-26 february 1998, *J. Phys. IV*, Vol. 8, Pr. 8, 1998.

Local strain and temperature measurements in non-uniform fields at elevated temperatures, Proceedings of the International Symposium held at Berlin, Germany, 14-15 March 1996, edited by J. Ziebs, J. Bressers, H. Frenz, D.R. Hayhurst, H. Klingelhöffer and S. Forest, Woodhead Publishing Limited, 1996.

3 Visits and stays in other institutions

Three weeks stay at the Institut fuer Mechanik of the Otto-von-Guericke Universitaet Magdeburg (Germany) with Prof. Albrecht Bertram, April 2012.

Two weeks at the International Research Center for Mathematics and Mechanics of Complex Systems (M&MOCS) de l'Univeristé La Sapienza, Rome, with Prof. F. Dell'Isola, April 2011.

One week at the Budapest University of Technology and Economics, wit Prof. Laszlo Szabo, Applied Mechanics Department, June 2008.

Two-week stay at the Weierstrass Institut für Angewandte Analysis und Stochastik (WIAS), with Prof. W. Dreyer, Berlin, february 2004.

Six-week stay at the Institut für Theoretische Physik (TU Berlin, FRG), with Prof. W. Muschik, june-july 2003.

One-week stay at Aristotle Technical University, Thessaloniki, Greece, in the group of Professor E.C. Aifantis, january 2001.

1-week stay at Partielle Differentialgleichungen und anwendbare Analysis of Technical University Darmstadt, invitation of Professor Hans-Dieter Alber (Fachbereich Mathematik), november 1999.

1-week stay at Mechanics Institue of Otto-von-Guericke University in Magdeburg (RFA, Décembre 1997) as invited scientist.

One-year stay at Bundesanstalt für Materialprüfung und Forschung (BAM - Berlin), within the framework of BRITE EURAM Project "Development of Microstructure Based Viscoplastic Models for an Advanced Design of Single Crystal Hot Section Components", 1994-1995.

4 Teaching Activities

Supervised PhD students

1998 **Marie-Dominique Dupuits** (coencadrement M. Boussuge, 14 juin 1998) : *Etude expérimentale et modélisation du comportement d'un matériau de joint de culasse pour application automobile*, (partenaire **RENAULT**).

2000 **Jean-Marc Cardona** (coencadrement G. Cailletaud, 20 décembre 2000) : *Comportement et durée de vie des pièces multiperforées : application aux aubes de turbine* (partenaire **SNECMA**).

2000 **Fabrice Barbe** (coencadrement G. Cailletaud, 22 décembre 2000) : *Modélisation du comportement mécanique d'agrégats polycristallins*.

2000 **Pascal Boubidi** (coencadrement G. Cailletaud, 18 décembre 2000) : *Experimental characterization and numerical modelling of low cycle fatigue in a nickel base single crystal superalloy under multiaxial loading*, thèse européenne en liaison avec le BAM-Berlin (projet européen **BRITE-EURAM**).

- 2001 **Rodolphe Parisot** (coencadrement A. Pineau, 5 avril 2001) : *Microstructure, déformation et endommagement d'un revêtement de zinc sur tôle d'acier*, (partenaire **SOLLAC**).
- 2003 **Jean-Sébastien Blazy** (coencadrement Y. Chastel (Cemef), 25 avril 2003), *Comportement mécanique des mousses d'aluminium : caractérisations expérimentales sous sollicitations complexes et simulations numériques dans le cadre de la l'élasto-plasticité compressible*, (partenaire **RENAULT**).
- 2003 **Toufik Kanit** (coencadrement D. Jeulin (Morphologie Mathématique), 12 mai 2003), *Notion de volume élémentaire représentatif pour les matériaux hétérogènes : approche numérique et statistique*, (partenaire **UNILEVER, UK**).
- 2003 **Virginie Goussery** (coencadrement Y. Bienvenu, 2 mars 2004), *Caractérisations microstructurale et mécanique de mousses de nickel à cellules ouvertes pour batteries de véhicules hybrides*, (partenaires **NITECH, INCO**).
- 2003 **Thierry Dillard** (coencadrement Y. Bienvenu, 4 mars 2004), *Caractérisation et simulation numérique du comportement mécanique des mousses de nickel : morphologie tridimensionnelle, réponse élastoplastique et rupture*, (partenaire **NITECH**).
- 2004 **Sylvain Flouriot** (coencadrement L. Rémy, 4 juin 2004), *Simulation de la fissuration en fatigue dans les superalliages à base de nickel monocristallins* (partenaire **SNECMA**).
- 2005 **Asmahana Zeghadi** (8 décembre 2005), *Effets de la morphologie tri-dimensionnelle et de la taille de grain sur le comportement mécanique d'agrégats polycristallins*, (partenaire **ARCELOR**).
- 2006 **Stéphanie Graff** (13 octobre 2006, coencadrement avec J.-L. Strudel et C. Prioul, Ecole Centrale de Paris) : *Simulation des instabilités de type Portevin–Le Chatelier, application aux anomalies de comportement viscoplastique du zirconium* (partenaire **CEA–CNRS, CPR SMIRN**).
- 2006 **Nicolas Marchal** (9 juin 2006, coencadrement L. Rémy), *Fissuration à haute température de superalliages monocristallins à base de nickel*, (projet européen **SOCRAX**).
- 2006 **Kamel Madi** (coadvisor M. Boussuge, 21 décembre 2006), *Caractérisation et simulation du comportement viscoplastique de réfractaires électrofondus à partir de leur microstructure*, (partenaire **SAINT-GOBAIN**).
- 2007 **Matthieu Mazière** (coencadrement J. Besson, B. Tanguy, 21 novembre 2007), *Prévision de l'éclatement de disques de turbines* (partenaire **SNECMA–TURBOMECA PRC DDV**).
- 2007 **Filip Siska** (coencadrement, P. Gumbsch, IWM Freiburg (Germany), 26 novembre 2007), *Approches continues et discrètes pour la plasticité des films minces métalliques* (réseau européen **SIZEDEPEN**).
- 2009 **Jeanne Belotteau** (coencadrement C. Prioul, C. Berdin, Ecole Centrale de Paris, 21 janvier 2009) *Comportement et rupture d'un acier au C-Mn en présence de vieillissement sous déformation*, (partenaire **EDF**).
- 2009 **Aurélie Jean** (coencadrement D. Jeulin, S. Cantournet, 19 février 2009), *Etude d'un élastomère chargé: de la nanostructure au macro-comportement* (partenaire **Michelin**).
- 2009 **Guillaume Abrivard** (coencadrement E. Busso, 20 novembre 2009), *A coupled crystal plasticity–phase field formulation to describe microstructural evolution in polycrystalline aggregates* (projet européen DIGIMAT).

- 2009 **Anaïs Gaubert** (coencadrement F. Gallerneau, 30 novembre 2009), *Modélisation des effets de l'évolution microstructurale sur le comportement mécanique du superalliage monocrystallin AM1* (thèse ONERA, DGA).
- 2010 **Kais Ammar** (coencadrement G. Cailletaud, B. Appolaire, 20 janvier 2010), *Modelling and simulation of phase transformation-mechanics coupling using a phase field method*, (pôle de compétitivité **System@tic**).
- 2010 **Ozgur Aslan** (29 mars 2010), *Microdamage modeling of fatigue crack growth in single crystal nickel-base superalloys* (projet européen STREP **Rolls Royce, RRD, SNECMA, Avio, MTU, Volvo, Siemens, Turboméca...**).
- 2011 **Huaidong Wang** (co-encadrement C. Berdin-Méric, M. Mazière, 18 mai 2011), *Comportement mécanique et rupture des aciers au C-Mn en présence de vieillissement dynamique sous déformation*, (thèse Centrale Paris, partenaire **EDF**).
- 2011 **Nicolas Cordero** (coencadrement E. Busso, 30 septembre 2011), *A Strain Gradient Approach to the Mechanics of Micro and Nanocrystals*, (projet **ANR Nanocrystals**).
- 2011 **Duy Khan Trinh** (18 novembre 2011), *Modèles d'homogénéisation d'ordre supérieur pour les matériaux architecturés*, (CPR CNRS Matériaux Architecturés Multifonctionnels).
- 2011 **Gwenael Trego** (coencadrement A.F. Gourgues, 20 décembre 2011), *Comportement en fluage à haute température dans le domaine biphasé ($\alpha + \beta$) de l'alliage M5* (partenaire **CEA Saclay**).
- 2012 **Yang Ding** (coencadrement M. Boussuge, 28 mars 2012), *Analyse morphologique de la microstructure 3D de réfractaires électrofondus à très haute teneur en zircon : relations avec les propriétés mécaniques, chimiques et le comportement pendant la transformation quadratique-monoclinique* (partenaire **Saint-Gobain**).
- 2012 **Prajwal Sabnis** (16 novembre 2012), *Modelling the propagation and bifurcation of plasticity induced cracks in Nickel base single crystal superalloys* (PRC Structures Chaudes, **ONERA, SNECMA**).
- 2012 **Anthony Marais** (26 novembre 2012, coencadrement M. Mazière), *Impact du vieillissement statique sur la transition ductile-fragile d'un acier C-Mn* (partenaire **EDF**).
- 2012 **Antonin Steckmeyer** (28 novembre 2012, coencadrement B. Fournier et S. Vincent), *Caractérisation et modélisation du comportement mécanique à haute température des aciers ferritiques renforcés par dispersion d'oxydes*, (partenaire **CEA Saclay**).
- 2012 **Justin Dirrenberger** (10 décembre 2012, coencadrement D. Jeulin), *Effective properties of architected materials* (projet **ANR Mansart**).
- 2012 **Xu Han** (14 décembre 2012, coencadrement J. Besson et B. Tanguy), *Modélisation de la fragilisation due au gonflement dans les aciers inoxydables austénitiques irradiés*, (partenaire **CEA Saclay**).
- 2013 **Damien Colas**, (8 novembre 2013, co-advisor E. Finot and M. Mazière), *Approche multi-échelles du vieillissement et du comportement mécanique cyclique dans le tantale* (partenaire **CEA-DAM Valduc**).
- 2014 **Alexandre Iltchev** (16 décembre 2014, co-advisors V. Marcadon and S. Kruch), *Periodic homogenisation of a cellular material in elastoplasticity and application to structural modelling : from small to large deformations*, (partenaire **ONERA**).

- 2015 **Aurélien Villani** (12 février 2015, co–advisor E.P. Busso), *A multi-physics modelling framework to describe the behaviour of nano-scale multilayer systems undergoing irradiation damage*, (projet européen **RADINTERFACE**).
- 2015 **Victor de Rancourt** (12 juin 2015, co-advisor B. Appolaire, E. Busso), *Modelling the oxidation of polycrystalline austenitic stainless steels using a phase field approach coupled with mechanics*, (Chaire **EDF**).
- 2015 **Arina Marchenko** (23 novembre 2015, co–advisor M. Mazière), *Multiscale investigation and modelling of room–temperature creep and sustained load cracking of titanium and quasi α Ti–alloys: Influence of hydrogen and oxygen content* (projet **ANR FLUTI**).
- 2015 **Erembert Nizery** (4 décembre 2015, advisor: JY Buffière (INSA Lyon), co-advisors: H. Proudhon, S. Forest), *Amorçage et propagation des fissures de fatigue dans les alliages d’aluminium 2050–T8 et 7050–T7451*, (partenaire **Constellium**).
- 2015 **Jia Li** (15 décembre 2015, advisors: S. Forest, H. Proudhon), *3D study of deformation and fatigue crack propagation of polycrystalline materials* (projet **ANR CRYSTAL**).
- 2016 **Pierre-Louis Valdenaire** (1 février 2016, advisors: A. Finel, Y. Lebouar, S. Forest), *Crystal plasticity–Transport equations and dislocation density*, (ONERA-LEM).
- 2017 **Chao Ling**, (24 janvier 2017, advisors: J. Besson, S. Forest, B. Tanguy), *Modélisation polycristalline de l’endommagement ductile dans les inoxydables austénitiques irradiés* (partenaire **CEA–EDF**).
- 2017 **Nicolas Guéninchault**, (24 mars 2017, advisors: H. Proudhon, S. Forest, W. Ludwig), *Experimental and numerical investigation of incipient plasticity in FCC polycrystals by X-ray synchrotron topotomography and CPFEM*, (partenaire **ESRF-Grenoble**).
- 2017 **Tang Gu**, (19 avril 2017, advisors: O. Castelnau, S. Forest, E. Hervé, H. Proudhon), *Multiscale modeling of the electrical and elasto-plastic behavior of architected and nanostructured Cu-Nb composite wires*, (projet **ANR METAFORES**).
- 2018 **Sicong Ren**, (18 janvier 2018, advisors: M. Mazière, T. Morgeneyer, S. Forest, G. Rousselier), *Field measurements and finite element simulations of the interaction between dynamic strain ageing and ductile damage in metallic alloys*, (thèse OPEN Centre des Matériaux).
- 2019 **Moubine Al Kotob**, (14 janvier 2019, advisors: S. Forest, M. Mazière, T. Rose, C. Combescure), *Competition between global and local instabilities in the failure of aeronautical structures*, (partenaire **SafranTech**).
- 2019 **Laurent Lacourt**, (14 octobre 2019, co-advisor D. Ryckelynck, F. Willot), *Etude numérique de la nocivité des défauts dans les soudures*, (partenaire **CEA–DAM Valduc**).
- 2019 **Aldo Marano**, (20 novembre 2019, co-advisor L. Gélébart), *Simulation numérique de la localisation intra-granulaire de la déformation au sein de polycristaux irradiés*, (partenaire **CEA Saclay**).
- 2019 **Harris Farooq**, (3 décembre 2019, co-advisors G. Cailletaud et D. Ryckelynck), *Crystal plasticity applied to aggregates under non-symmetric cyclic loadings: Mechanical analysis and model order reduction*, (partenaire **Chaire Cristal SafranTech**).
- 2020 **Jean-Michel Scherer**, (19 octobre 2020, co-advisors J. Besson, B. Tanguy, J. Hure), *Strain localization and ductile fracture in single crystals: application to irradiated austenitic stainless steels*, (partenaire **CEA Saclay**).

- 2022 **Vikram Phalke**, (12 janvier 2022, coadvisor A. Roos), *Prediction of size effects and regularization of adiabatic shear band formation in single and polycrystals: Gradient crystal plasticity approach* (Horizon 2020 Marie Curie ITN ENABLE)
- 2022 **Houssein Eddine Chaieb**, (8 février 2022, coadvisor V. Maurel, K. Ammar), *Multiscale approach of the mechanical behaviour of hot-dip Zn-Al-Mg coatings on a steel sheet* (partenaire **Arcelor-Mittal OCAS**).
- 2022 **Natan Guillermin**, (23 mars 2022, co-supervisor M. Mazière), *Détection et simulation d'instabilités viscoplastiques dans les disques de turbines* (partenaire **Safran HE**).
- 2022 **Raffaele Russo**, (23 mai 2022, co-supervisor F. Girot Mata), *Cosserat thermo-mechanics under finite deformations: Theory and finite element implementation* (projet européen Horizon 2020 Marie Curie ITN ENABLE).
- 2022 **Clément Cadet** (19 septembre 2022, coadvisor P. Kerfriden), *Ductile failure of random porous materials: Computational approach and application to weld defects* (partenaire **CEA DAM Valduc**).
- 2022 **Mohamed Abatour** (16 novembre 2022), *Automatic regularization of finite element simulations of elastoplasticity at finite strains* (partenaire **Transvalor**).
- 2023 **Mouad Fergoug** (3 février 2023, coadvisor: Basile Marchand), *Development of a model error estimation strategy and application to multi-scale model adaptation*, (partenaire **SafranTech**).
- 2023 **Antoine-Emmanuel Viard** (14 mars 2023, supervisor: J. Dirrenberger), *Instabilités matérielles dans les milieux architecturés : plasticité de Piobert-Lüders et superélasticité*, (projet **ANR ALMARIS**).
- 2023 **David Siedel** (3 mai 2023, advisors: J. Besson, O. Fandeur, T. Helfer) *A robust numerical approach for the description of brittle fracture and viscoplastic behavior of fuel rods*, (partenaire **CEA Saclay/Cadarach**).
- 2023 **Flavien Ghiglione** (8 décembre 2023, co-advisor: B. Appolaire, A. Ask, K. Ammar) *Phase field and Cosserat simulation of recrystallization in polycrystals*, (partenaire **CNRS 80prime**).
- 2024 **Paul Béguin** (11 janvier 2024, co-advisor: V. Yastrebov, C. Ovalle) *Conductivity of contact interfaces: A multiscale study* (thèse OPEN Centre des Matériaux).
- 2024 **Wajih Jbara** (1 mars 2024, co-advisor: V. Maurel, K. Ammar) *Analyse expérimentale et modélisation par champs de phase du couplage mécanique/diffusion* (thèse OPEN Centre des Matériaux).
- 2024 **Manon Lenglet** (10 avril 2024, co-advisor: Anna Ask) *Modèle d'endommagement de fatigue en lien avec la microstructure dans un alliage d'aluminium* (partenaire ONERA).
- 2024 **Yaovi Armand Amouzou-Adoun** (28 novembre 2024, co-advisor M. Jebahi, F. Abed-Meraim, Arts et Métiers) *Investigation of size effects in a gradient-enhanced crystal plasticity framework* (**ANR SGP-Gaps**)
- 2025 **Mikel Bengoetxea-Aristondo** (1er decembre 2025, co-advisors V. Maurel and K. Ammar) *Multiscale investigation of the solidification, microstructure and mechanical behaviour of Zn-Al-Mg coatings on steel sheets* (partenaire OCAS-ArcelorMittal)
- 2026 **Pauline Stricot** (6 mars 2026, co-advisors A. Ask and L. Toualbi) *Study of the microstructural evolution of polycrystals under mechanical and thermal loading by in situ observations and numerical modeling* (partenaire ONERA, projet ANR Moomin)

- 2026 **Elodie Barrot** (24 mars 2026, co-advisors S. Feld-Payet) *Yield surface evolution and identification of a predictive behavior for stress redistributions in a turbine disk* (partenaires : SafranTech + ONERA)
- 2026 **Florian Billon** (9 avril 2026, co-advisors A. Vattré) *Physical modeling of non-monotonic viscoplastic behavior at finite deformations: Portevin-Le Chatelier effect in a nickel-based superalloy* (partenaires : Safran AE + ONERA)

Post-docs

- 2002–2004 Fouad El Houdaigui** : Dimensionnement d'un composant multicristallin d'un micro-système mécanique (partenaire **SAGEM**)
- 2003–2005 Hakim Benouali** : Modèles continus pour la plasticité des mousses métalliques (projet européen **DEFINO**)
- 2006–2007 Ovidi Casals** : Indentation of metal thin films (projet européen **SizeDepEn**)
- 2009–2010 Hyung-Jun Chang** : Comparing DDD and gradient plasticity models (**ANR Cat-Size**)
- 2009–2011 Kais Ammar** : Phase field and gradient plasticity models (**ANR COUPHIN**)
- 2013–2014 Abderrahim El Khabbaz** : Conception d'un matériau architecturé pour les tubes de générateur de vapeur des centrales nucléaires (**Chaire AREVA**)
- 2015–2016 Martin Horak** : Order reduction methods for generalized continua (**ANR Micromorfining**)
- 2016–2018 Anna Ask** : Cosserat phase field modelling and simulation of viscoplasticity induced grain boundary migration and recrystallisation in metallic polycrystals (**Marie Skłodowska Curie Action H2020**)
- 2018–2019 Le Lu Tuan** : Multiscale modelling of new high strength and high strain hardening titanium alloys (**ANR TITWIP**)
- 2021–2023 Ahmed Zouari** : Influence de la rhéologie des surfaces d'aciers sur l'endommagement et des revêtements galvanisés alliés avec Al et Mg (**France Relance 2021**)
- 2023–2024 Mathias Lamari** : Mesoscopic Model Informs Engineering Crystal Plasticity (**ANR MESOCRYSP**)

Teaching activities

Two Master Courses (Mathématique et Mécanique Fondamentale, Université Paris Saclay) on *Mechanics of generalized continua* and *Elastoviscoplastic constitutive laws at finite deformation* (2019-...)

Course on *Continuum Mechanics* at Ecole des Mines de Paris (35 hours including magistral courses and training sessions). The course is based on a two-volume book [Mécanique des milieux continus](#) (2004-...).

Master course *MAGIS Internal lengths in metal deformation*, (9h), 2009-....

Master course *DMSE Multiscale plasticity of metals and alloys*, (9h), 2010-....

Exercises of the course on *Mechanics of Solid Materials* with Prof. G. Cailletaud first year student at Ecole des Mines de Paris, 1996–2001 (16h).

Major on *Mechanics of inelastic solids* (1997, 1999, 2001) : course on *Nonlinear constitutive equations at finite strain* (3h) and small project on the finite element method for nonlinear solids.

Summer schools and training sessions for researchers, doctoral students and engineers

Summer School on *Multiscale Approaches for Architected and Microstructured Materials and Metamaterials*, coordinated by A. Madeo and J.F. Ganghoffer, supported by Université franco-allemande and European Commission, Nantes, France, 13-18 october 2025.

Eleventh Summer School on, *Phase fields and mechanics*, course given by A. Finel, S. Forest, F. Lurlano and A. Miranville, Quiberon, France, 5-10 septembre 2022.

CISM Advanced School on *Mechanics of strain gradient materials*, coordinated by A. Bertram and S. Forest, lectures also by L. Bardella, C. Niordson, W.H. Müller and P. Seppecher, Udine May 14–18 2018.

CISM Advanced School on *Mesoscale models: From micro-physics to macro-interpretation*, coordinated by S. Forest, S. Mesarovic and H. Zbib, lectures also by I. Groma, D. McDowell and J.N. Roux, Udine May 22–26 2017.

Summer Schools on Mechanics of generalized continua and their applications to engineering materials and structures (co-organizer):

- *Inaugural Summer School*, Arpino (Italy), July 20–26th 2015, 40 participants
- *Elastic Meta-Materials*, Alghero (Italy), 22–29 May 2016, 40 participants

French–German Summer School on *Evolutionary Solid Bodies*, organised by F.J. Barthold and J.F. Ganghoffer under the auspices of the Université Franco–allemande/Deutsch–Französische Hochschule, Bollendorf, Oct. 4-10, 2015.

Second Summer School of Theoretical Mechanics on *Mechanics of Generalized Continua*, courses by G. Del Piero, S. Forest and P. Seppecher, Quiberon (France, June 3–8 2013.

GAMM *Multiscale Material Modeling* Summer School 2012, organized by T. Böhlke, S. Diebels and B. Svendsen, Bad Herrenalb, Germany, September 2-7, 2012.

CISM Advanced School on *Generalized continua: From the theory to engineering applications*, coordinated by Holm Altenbach and Victor Eremeyev, lectures by H. Altenbach, R. De Borst, V. Eremeyev, S. Forest, G. Maugin, P. Steinmann, Udine September 19–23 2011.

CISM Advanced School on *Plasticity and beyond: Microstructures, crystal plasticity and phase transitions*, coordinated by Joerg Schroeder and Klaus Hackl, lectures by S. Forest, K. Hackl, J. Kratochvil, M. Kuroda, V. Levitas and J. Schroeder, Udine June 27–July 1 2011.

CNRS Advanced School, *ARCHIMAT, Matériaux architecturés multifonctionnels*, Autrans, 22–28 May 2011.

CNRS Advanced School, *Scale transitions in the mechanics of materials*, CE2M10, Briançon, August 23–Septembre 3 2010.

CNRS Advanced School, *Mechanics of Nano-Objects*, Autrans, March 14–19, 2010.

French–German Advanced School, *Vom Modell zum Experiment*, Bad Herrenalb, RFA, 6-12 septembre 2009.

CISM Advanced School on *Generalized continua and dislocation theory: Theoretical concepts, computational methods and experimental verification*, coordinated by Carlo Sansour, lectures by M. Fivel, S. Forest, K. Hemker, G. Maugin, C. Sansour and H. Zbib, Udine, 9–13th July 2007.

European master in Computational Mechanics of Materials and Structures (COMMAS), 3 lectures on Micromechanics of single and polycrystals, 10–11 oct. 2006, Universität Stuttgart, organized by Prof. Miehe.

Short Course in Mathematical Modelling in Solid Mechanics, organized by the Fakultät für Mathematik Universität Karlsruhe, Institut für praktische Mathematik, C. Wieners, teachers: S. Forest, P. Neff and C. Wieners, 5–7 october 2005.

Mécanique non linéaire des matériaux : comportement, endommagement et méthodes numériques, J. Besson, G. Cailletaud, J.L. Chaboche et S. Forest, formation IPSI, 16-19 septembre, Paris, 1997.

5 Contracts with industry and state

All PhD works are associated with an industrial financing contract with the partners mentioned earlier : SNECMA, RENAULT, ARCELOR-MITTAL, SAINT-GOBAIN, EDF, CEA, INCO Special Products, SAGEM, UNILEVER... These contracts are not listed here for brevity.

Contract France Relance, Arcelor-Mittal and OCAS, *Mechanics of zinc coatings on galvanized steel sheets*, 2021–2026.

Contract CEA-DAM (Valduc), *Polycrystalline plasticity in Tantalum: Forming process and microstructure evolution*, 2024–2027.

Contract CEA-DAM (Valduc), *Lifetime assessment of welded zones in a titanium alloy*, 2016–2019, 2019–2022.

Contract ANR-21-CE08-0030-03 MESOCRYSP, *Mesosopic Model Informs Engineering Crystal Plasticity*, partners: PMMH-ESPCI (coordinator), LSPM (Université Paris Nord), 2021-2025.

Contract ANR-15-CE08-0013 TITWIP, *New titanium alloys with a combination of high strength, strain hardening and high ductility, induced by TRIP and TWIP effects*, Chimie ParisTech (coordinator), ONERA-CNRS-LEM, Mines ParisTech, 2015–2019.

Contract ANR-14-CE07-0035-03 MICROMORFING (Défi “Stimuler le renouveau industriel”), Milieux Micromorphes: Modélisation multiphysique et Simulation Numérique Avancées de Procédés de Mise en Forme: UTT (coordinateur), UTC, Mines ParisTech, 2014–2019.

Contract ANR METAFORES (Programme blanc 2012), Matériaux à architecture élémentaire sur mesure pour réponse fonctionnelle optimisée : de l’expérience à la simulation, partenaires : PPRIME (coordinateur), CNRS UP Poitiers, PIMM ENSAM, CdM Mines ParisTech, 2012-2016.

PRC Structures chaudes, cas de la fissuration des aubes de turbines monocristallines, ONERA et SNECMA, 2009-2012.

Simulation de l’oxydation de l’acier 316L par la méthode des champs de phase, chaire EDF (2011-2014)

Fatigue of tantalum, Contrat CEA DAM (2010-2013)

CPR CNRS MAM, Matériaux Architecturés Multifonctionnels, partenaires : SIMAP (coordinateur), INSA Lyon, Arcelor Research, EDF Renardières, 2008–2011.

Contract ANR MANSART (Programme Matériaux et Procédés 2008), Matériaux sANdwiches ARchiTecturés, partenaires : ONERA (coordinateur), MATEIS Lyon, Arcelor Research, ENSAIT toulouse, SIMAP Grenoble, AIRBUS, ATEAA, 2008-2012.

Contract ANR COUPHIN (Programme blanc 2008), Couplage entre champ de phases et plasticité cristalline continue, partenaires : Institut Jean Lamour (coordinateur), ONERA–LEM Paris, 2008-2012.

Contract ANR NANOCRYSTALS (Programme blanc 2007), Modélisation multiéchelles du comportement mécanique des nanocristaux métalliques, partenaires : GeorgiaTech Lorraine (coordinateur), LPMM Metz, 2007-2011.

Contract ANR CAT-SIZE (Programme Matériaux et Procédés 2007), Développement, application et validation d'une approche Multi-échelles incluant les effets de longueurs internes, partenaires : Arcelor Research (coordinateur), SIMAP Grenoble, LPMM Metz, 2008-2011.

Contract CEA-Saclay, Comportement mécanique des aciers ODS, 2009-2012.

Contract SNECMA, Simulation de la bifurcation de fissure par fatigue dans les monocristaux de superalliage, 2009-2012.

Contract EDF, Vieillissement statique et dynamique d'un acier C-Mn, 2008-2011.

Contract Michelin, Calcul de microstructures pour les élastomères chargés : influence du mélangeage, 2006-2009.

F. El Houdaigui, S. Forest, A.-F. Gourgues, *Propriétés effectives élastoplastiques d'une charnière multicristalline*, convention SAGEM-Armines, 2002-2004.

Programme Matériaux CNRS 2001, Approches multiéchelles des propriétés macroscopiques des matériaux de structure. Projet : *Comportement mécanique de composites à nano-renforts flexibles* (UMR 5010, 5510, 5301, 7633).

T. Kanit, S. Forest, V. Mounoury, D. Jeulin, *Determination of a representative volume element for random microstructures : application to waterice products*, convention Unilever-Armines, No. SRA1.3/PS00085, june 2000.

J. Olschewski, R. Sievert (Berlin), B. Svendsen (Dortmund), S. Forest (Evry), projet DFG (Deutsche Forschungsgemeinschaft) : Beschreibung des Verfestigungsverhaltens metallischer Werkstoffe unter dem Einfluss stark inhomogener Verformung zur Berechnung des Fortschritts makroskopisch grosser Risse unter zyklischer Belastung, 1999-2001.

6 European contracts

Marie Skłodowska-Curie Actions Research and Innovation Staff Exchange RISE project entitled FRAMED, *Fracture Across Scales and Materials, Processes and Disciplines* (H2020-MSCA-RISE-2016), coordinated by University of Sheffield. Partners: University of Erlangen Nuremberg, Mines ParisTech, Uppsala University, Aristotle University, Beijing University of Civil Engineering and Architecture, Nosov Magnitogorsk State Technical University, Perm National Research Polytechnic University, Politecnico di Torino, Aston University, Universitat fur Bodenkultur, Michigan Technological University, University of Arizona, Shanghai University, ITMO University, 2017-2021.

Marie Skłodowska-Curie Innovative Training Network ENABLE, *European Network for Alloys Behaviour Law Enhancement* (H2020-MSCA-ITN-2017, type of action: European Training Network), coordinated by Université de Bordeaux. Partners: Mines ParisTech, ENI Tarbes, Lulea Technical University, Universidad del Pais Vasco, Basque Center for Applied Mathematics, Fundacion Tecnalia Research & Innovation, Safran SA, Sirris Het Collectief Centrum van de Technologische Industrie, 2018-2022.

Marie Skłodowska Curie Action H2020-MSCA-IF-EF-ST entitled MIGRATE, *Cosserat phase field modelling and simulation of viscoplasticity induced grain boundary migration and recrystallisation in metallic polycrystals*, 2 year post-doc position for Anna Ask, 2016-2018.

FP7 European Project RADINTERFACES, *Multiscale Modelling and Materials by Design of interface-controlled Radiation Damage in Crystalline Materials*, Collaborative project Small or medium-scale focused Research Project, UMI-CNRS Georgia Tech Lorraine (coordinator, France-USA), University of Oviedo (Spain), Universidad Politecnica de Madrid (Spain), Ecole des Mines de Paris, ARMINES, Czech Technical University in Prague, Università degli Studi di Cagliari (Italy), University of Tartu (Estonia), Uppsala University (Sweden), Instituto madrilenio de estudios avanzados (Spain), Los Alamos National Laboratory (USA), 2011–2014.

Predictive methods for combined cycle fatigue in Gas Turbine Blades (6th RTD framework program), PREMECCY; Partners: Institute of Physics of Materials, Academy of Sciences of the Czech Republic, Ecole Centrale de Paris, Mines ParisTech, Technische Universität Dresden, MTU Aero Engines GmbH, Rolls-Royce Deutschland Ltd & Co KG, Avio S.P.A. (Italy), Politecnico di Milano Fundacion Inasmet, Industria de Turbo Propulsores, S.A. (Spain), Volvo Aero Corporation (Sweden) Siemens Industrial Turbomachinery Ltdh (UK). Coordination: Rolls-Royce PLC, Turbine Systems - Engineering (UK), 2006–2011.

Marie-Curie Research Training Network (RTN) entitled *SizeDepEn - Engineering mechanics based on size-dependent materials properties*, partners : Universität Karlsruhe (FRG), University of Edinburgh (UK), Rijksuniversiteit Groningen, Fraunhofer Institut für Werkstoffmechanik Freiburg (FRG), Eötvös University Budapest, contract No. MRTN-CT-2003-504634, 2004–2008.

Research Training Network (RTN) entitled *DEFINO – Deformation and fracture instabilities in novel materials and processes*, partners : Aristotle University Thessaloniki (Greece), University Cambridge (UK), Technical University Delft (The Netherlands), Technical University Braunschweig (FRG), University Libre Brussels (Belgique), Eötvös University Budapest, University Kaiserslautern (FRG), 2003–2007.

Competitive and Sustainable Growth Programme, European Project SOCRAx entitled *Expanding the limits of single crystal superalloys through short crack fracture mechanics analysis*, partners : ONERA (France), National Technical University of Athens (Greece), SNECMA Moteurs (France), Siemens Power Generation (FRG), MTU Aero Engines GmbH (FRG), Imperial College of Science, Technology and Medicine (UK), Bundesanstalt für Materialforschung und -prüfung (FRG), Consiglio Nazionale delle Ricerche (Italy), Institute of Mechanics of Materials and Geosstructures S.A. (Greece), contract No. G5RD-CT-2002-00819, 2002–2006.

7 Committees and evaluation

Elected Member of the IUTAM Congress Committee for the preparation of the ICTAM events (2020-2024), reelected for 2024-2028.

Member of the Industrial Engineering panel, chaired by V. Tverggard, of the Research Quality Evaluation (RQ20) at the Lund University (May 4–8 2020).

Member (2020-2025) and Co-chairman (2022-2026) of the European Solid Mechanics Conference Committee, chaired by Prof. G. Holzapfel. <https://euromech.org/structure/conference-committees/esmcc>

President of the Haut Comité de la Mécanique (HCM), advisory committee of the French Association of mechanics (AFM) (2024-...).

Representative of France at the General Assembly or Congress Committee of the International Union of Theoretical and Applied Mechanics (IUTAM, 2018-...).

- Congress Committee meeting at Dpt of Engineering, Cambridge University (UK), 22-24 August 2022

- General Assembly Meeting Zoom meeting due to the COVID emergency, 22-25 August 2021 (ICTAM 2020+1 Virtual)
- General Assembly Meeting Zoom meeting due to the COVID emergency, 25-26 August 2020
- General Assembly Meeting at Northeastern University, Boston, Massachusetts 23-24 July 2018

<https://iutam.org/a-propos/iutam-general-assembly/>

CNFM Member (Comité National Français de Mécanique) interfacing IUTAM and the French Mechanics Community (2013–...).

Member of the EMMC committee (European Mechanics of Materials Conference) of the Euromech society (2010–2018).

Member of the organizing committee IMMC (International Material Modeling Conference) lead by Prof. A. Bertram: ICMM1, Dortmund (2009); ICMM2, Paris (2011), Varsaw (2013), Berkeley (2015), Rome (2017), Lund (2019), Cape Town (2022), London (2024).

Member of evaluation committee at HCERES (French Evaluation Committee), DFG (Germany), Swedish Research Council.

Member of jury of the Pierre Bezier Prize (for Arts et Métiers best PhD works)), and the Jean Mandel Prize (for French outstanding researchers younger than 40).

Member of the research committee “Multiscale Material Modelling” of the German Society of Applied Mathematics and Mechanics (GAMM), 2006–2009.

Member of the Board of Directors of the association MECAMAT for the development of the mechanics of materials 1998–2006.

8 Review of articles in international journals

Acta Materialia	19
Acta Mechanica	15
Advanced Modeling and Simulation in Engineering Sciences	2
Aerospace Science and Technology	1
Archive of Applied Mechanics	50
Archives of Mechanics	2
ASCE Journal of Engineering Mechanics	3
ASME Journal of Engineering Materials and Technology	2
Biomechanics and Modeling in Mechanobiology	2
Comptes Rendus à l'Académie des Sciences	14
Composite Structures	6
Composites Science and Technology	2
Computational Materials Science	28
Computational Mechanics	14
Computer Methods in Applied Mechanics and Engineering	36
Computers and Structures	6
Continuum Mechanics and Thermodynamics	38
European Journal of Mechanics A/ Solids	50
Engineering Fracture Mechanics	7
Engineering with Computers	1

Experimental Mechanics	1
Extreme Mechanics Letters	2
Finite Elements in Analysis and Design	3
The European Physical Journal Applied Physics	2
International Journal of Engineering Science	6
International Journal of Damage Mechanics	9
International Journal of Fatigue	2
International Journal of Forming Processes	1
International Journal of Fracture	5
International Journal of Mechanical Sciences	11
International Journal for Multiscale Computational Engineering	2
International Journal of Non-Linear Mechanics	5
International Journal for Numerical Methods in Engineering	24
International Journal of Plasticity	89
International Journal of Solids and Structures	123
International Journal of Vehicle Design	1
Journal of Alloys and Compounds	3
Journal of Applied Mechanics	5
Journal of Elasticity	4
Journal of Engineering Manufacture	2
Journal of Materials Research	2
Journal of Materials Science	6
Journal of the Mechanics and Physics of Solids	38
Journal of the Mechanics of Materials and Structures	3
Journal of Micromechanics and Microengineering	3
Journal of Multiscale Computational Engineering	2
Journal of Nuclear Materials	2
Journal of Physics A: Mathematical and General	2
Journal de Physique IV	6
Materials & design	1
Materials at High Temperatures	1
Materials Science and Engineering A	9
Mathematics and Mechanics of Solids	7
Meccanica	7
Mechanics of Materials	22
Mechanics Research Communications	5
Metallurgical and Materials Transactions A	5
Mécanique et Industries	4
Modelling and Simulation in Materials Science and Engineering	17
Nature	1
Nuclear Engineering and Design	1
Philosophical Magazine	24
Philosophical Magazine Letters	5
Polymer	1
Probabilistic Engineering Mechanics	2
Proceedings A of the Royal Society	13
Progress in Materials Science	1
Revue de Métallurgie	2

Scripta Materialia	9
Smart Materials and Structures	1
Strain	1
Technische Mechanik	8
Zentralblatt Mathematik	5
Zeitschrift fuer Angewandte Mathematik und Mechanik	8
Zeitschrift fuer Angewandte Mathematik und Physik	3