Julien YVONNET
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RESEARCH INTERESTS

Numerical modeling of complex materials, computational homogenization, multiscale methods for solid materials, fracture and interface modeling, nanomechanics, forming processes simulation, numerical methods.

EDUCATION

2009	Habilitation à Diriger des Recherches[1] (H.D.R)	Mechanics	University Paris-Est, France
2004	**Ph.D. thesis**	**Mechanical Engineering**	**ENSAM[2] Paris, France**
2002	M.S.	Mechanical Engineering	ENSAM Paris, France
2001	Agregation[3]	Mechanical Engineering	Ecole Normale Supérieure, Cachan, France
2000	B.S. (eq.)	Mechanics and technologies	Ecole Normale Supérieure, Cachan - University Paris VI, France

ACADEMIC EXPERIENCE

2020-	Deputy head of the Multiscale Modelling and Simulation Laboratory (MSME), Université Gustave Eiffel, France (100 members)
2014-2019	Head of the Mechanical division of the Multiscale Modelling and Simualtion Laboratory (MSME), Université Paris-Est Marne-la-Vallée, France

[1] H.D.R. is the highest academic qualification in France, mandatory to be an independent PhD advisor and to reach full professorship.
[2] Ecole Nationale Supérieure des Arts et Métiers.
[3] Agregation is a French national competition for positions in the public education system.

2010-	**Full Professor**, Université Paris-Est Marne-la-Vallée, France
2005-2010	**Associate professor**, Université Paris-Est Marne-la-Vallée, France
2003-2005	Temporary professor, ENSAM Paris, France
2002-2003	Temporary lecturer, ENSAM Paris, France
	Temporary lecturer, Université Marne-la-Vallée, France

HONORS AND AWARDS

- IACM 2018 John Argyris Award for young scientists (The International Association for Computational Mechanics)
- ECCOMAS 2014 O.C. Zienkiewicz award (The European Community on Computational Methods in Applied Sciences
- Fellow of the French University Institute (Institut Universitaire de France, IUF), Junior member, associated with a 5-years research grant) (2013)

AWARDS OBTAINED BY PhD STUDENTS

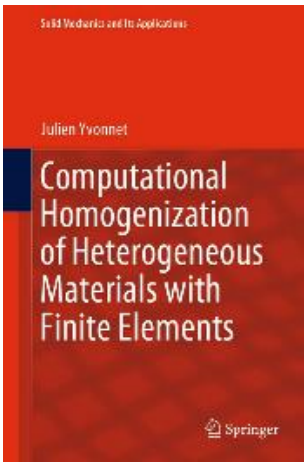
- S. Nezamabadi, Best PhD award from the French Association of Computational Mechanics (CSMA), 2009
- T.T. Nguyen, Best PhD award from the French Association of Computational Mechanics (CSMA), 2015
- D. Da, Melosh Competition finalist for best PhD award, 2019

SUMMARY OF SCIENTIFIC ACTIVITIES

- **121** articles in peer-reviewed journals including: Computer Methods in Applied Mechanics, International Journal for Numerical Methods in Engineering, Journal of the Mechanics and Physics of Solids, Journal of Applied Physics, Nanotechnology, Composite Science and Technology, Journal of Computational Physics, International Journal of Solids and Structures, Mechanics of Materials, MRS Bulletin, Journal of Applied Mechanics, etc. (see the complete list of publications).
- Citations (August 2026)
  Isi Web of Science: **5422** h-index = **41**
  Google Citations: **8492**, h-index = **50**
- **1** Monograph
- **9** book chapters
- **182** communications in national and international conferences
- **6** plenary conferences in international or national conferences
- **2** semi-plenary conference in an international conference
- Involved in the organization of **38** international conferences and local scientific events
- Member of the editorial board of **11** international journals
- **18** visiting positions (China, Singapore, USA, Spain, Greece, Japan)
- **22** funded contracts as PI or co –PI.
- **28** advised PhD theses including **24** defended, **8** post-doctoral fellows and **18** master students advised

MONOGRAPH

[1] J. Yvonnet, **Computational Homogenization of Heterogeneous Materials with Finite Elements**, Springer, 2019 ISBN: 978-3-030-18382-0.



CURRENT RESEARCH ACTIVITIES

My current activities deal with **multiscale modelling of solid materials**, including linear and nonlinear, multi-physics behaviors, with gradient effects, using computational approaches. The methods involve in particular the **modelling of cracks in heterogeneous materials** and their effect on the effective behavior of the material. Applications are related to civil engineering materials, composites and energy harvesting systems.

RESEARCH ACHIEVEMENTS

- A first major achievement is the development of **numerical multiscale (homogenization) methods** to study **nonlinear, multiphysics and time-dependent heterogeneous materials**. Over the last years, I have introduced several innovative strategies to make these approaches computationally tractable using **model reduction** and **Data-driven/Artificial Intelligence tools** (neural networks, unsupervised machine learning, clustering).
- Another strong achievement is the development of fracture simulation in complex microstructures of materials. My group has pioneered the use of the phase field method to **fracture** in experimental, realistic, **image-based models of materials**. I have developed many modelling and computational extensions of these fracture simulation methods for different classes of applications including civil engineering, composites or 3D printed materials, taking into account interface fracture, stochastic microstructures and process-induced fracture anisotropy as found in 3D printed parts.
- Finally, I have also conducted with my group pioneering works on the design of fracture-resistant materials by **combining topology optimization and fracture simulation** methods in heterogeneous materials.
- Other very recent and promising developments include innovative methods based on harmonic approaches to construct **multiscale models of mechanical damage**.
- These scientific advanced have been conducted both through academic and aerospace/naval industry/energy industrial collaborations (Safran, EDF, CEA, ONERA, Naval Group, WeAre Aerospace).

PAPERS IN REFERRED JOURNALS

[121] N. Zeaiter, J. Yvonnet, B. Bary, G. La Valle, A computational homogenization procedure for predicting coupled thermal-hydration shrinkage of heterogeneous cementitious materials during early-age desiccation, **Mechanics of Material**, accepted, 2027.
[120] Z. Li, J. Yvonnet, C. Desceliers, Topology optimization of reinforced structures for fracture resistance in the presence of random defects, **Computer Methods in Applied Mechanics and Engineering**, accepted, 463:119357, 2027.
[119] Y. Kojima, J. Yvonnet, K. Endo, Y. Harada, M. Muramatsu, Predicting inclusion-type internal defects in composites with complex structural shapes from experimental infrared thermography and numerical simulations: a demonstration of a machine learning approach based on graph neural networks, **Composites Part B**, 326: 114041, 2026.
[118] J. Yvonnet, An interpretable error indicator for neural network surrogate models based on encoder-regression decomposition, **Computer Methods in Applied Mechanics and Engineering**, 426 : 119248, 2026.
[117] X. Chen, J. Yvonnet, S. Yao, Multi-Material Dynamic Topology Optimization for Customized Wide-Bandwidth Flexoelectric Structures, **Composite Structures**, 394; 120690, 2026.
[116] J. Yvonnet, DDHADTENS: A program for extracting anisotropic damage variables from tensors using Harmonic Analysis, **Computer Physics Communications**, 325: 110171, 2026.
[115] Z. Chafia, J. Yvonnet, J. Bleyer, A bridging-domain approach for multiscale modeling of anisotropic fracture in large-scale heterogeneous structures, **Computer Methods in Applied Mechanics and Engineering**, 425: 118774, 2026.
[114] J. Yvonnet, Qi-Chang He, Microstructure-based machine learning of damage models including anisotropy, irreversibility and evolution, **Journal of the Mechanics and Physics of Solids**, 106160, 2025.
[113] Z. Chafia, J. Yvonnet, J. Bleyer, Bridging overlapping coarse and fine meshes within the phase field fracture method, **International Journal for Numerical Methods in Engineering**, 126(9), e70043, 2025
[112] X. Chen,J. Yvonnet, S. Yao, J. Hu, Y. Huang, Strong C1-coupling Multi-Patch Isogeometric Topology Optimization of Complex Structures for Strain Gradient Problems, **International Journal of Solids and Structures**, 113256 , 2025.
[111] Z. Chafia, J. Yvonnet, J. Bleyer, A Data-Driven-based homogenization method to simulate the anisotropic damage of quasi-brittle heterogeneous structures, **Computer Methods in Applied Mechanics and Engineering**, 437: 117747, 2025.
[110] A. Ketata, J. Yvonnet, N. Feld, F. Detrez, A. Parret-Freaud, Structural zoom for linear composite materials based on adaptive mesh and homogenization, **Meccanica**, 1-38, 2025.
[109] Z. Chafia, J. Yvonnet, J. Bleyer, S. Vincent, S. El Ouafa, Massively parallel phase-field fracture simulations on supercomputers: towards multi-billion Degree-of-freedom computations, **Advanced Modelling and Simulation in Engineering Sciences,** 11(1), 25, 2024.
[108] S. Chaouch, J. Yvonnet, Unsupervised machine learning classification for accelerating FE2 multiscale fracture simulations, **Computer Methods in Applied Mechanics and Engineering**, 432: 117278, 2024.
[107] X. Chen, S. Yao, J. Yvonnet, Nonlinear topology optimization of flexoelectric soft dielectrics at large deformation, **Computer Methods in Applied Mechanics and Engineering**, 427: 117005, 2024.
[106] X. Chen, S. Yao, J. Yvonnet, Multiscale topology optimization of an electromechanical dynamic energy harvester made of non-piezoelectric material, **Structural and Multidisciplinary Optimization**, 67:66, 2024.
[105] P. Li, Y. Wu, J. Yvonnet, S. Liu, S. Gu, Phase field modeling of dynamic fracture in elastoplastic composites taking into account interfacial debonding, **Engineering Fracture Mechanics**, 295: 109792 2024.
[104] S. Chaouch, J. Yvonnet, An unsupervised machine learning approach to reduce nonlinear FE2 multiscale calculations using macro clustering, **Finite Element in Analysis and Design**, 229: 104069, 2024.

[103] J. Yvonnet, D.Da, Topology optimization to fracture resistance: a review and recent developments, **Archives of Computational Methods in Engineering**, accepted, 2023.
[102] P. Kumar, A.V. Kumara, P. Li, J. Reinosob, Q.-C. He, J. Yvonnet, M. Paggi, SIMP Phase-field topology optimisation framework to maximise fracture resistance in FGMs, **Composite Structures**, Accepted, 2023.
[101] J. Yvonnet, Q.-C. He, P. Li, Reducing internal variables and improving efficiency in data-driven modelling of anisotropic damage from RVE simulations, **Computational Mechanics**, 72: 37–55, 2023.
[100] X. Chen, S. Yao, J. Yvonnet, Dynamic analysis of flexoelectric systems in the frequency domain with Isogeometric Analysis, **Computational Mechanics**, 71: 353–366, 2023. [99] Y. Wu, J. Yvonnet, P. Li, Topology optimization for enhanced dynamic fracture resistance of Structures, **Computer Methods in Applied Mechanics and Engineering**, 394:114846, 2022.
[98] J. Yvonnet, Q.-C. He, P. Li, A data-driven harmonic approach to constructing anisotropic damage models with a minimum number of internal variables, **Journal of the Mechanics and Physics of Solids**, 162:104828, 2022.
[97] P. Li, J. Yvonnet, Y. Wu, Improved fracture resistance of 3D-printed elastoplastic structures with respect to their topology and orientation of deposited layers, **International Journal of Mechanical Sciences**, 220: 107147, 2022.
[96] M.A. Benaimeche, J. Yvonnet, B. Bary, Q.-C. He, A k-means clustering machine learning-based nonlinear multiscale method for anelastic heterogeneous structures with internal variables, **International Journal for Numerical Methods in Engineering**, 123:2012–2041, 2022.
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[A71] D.Da, J. Yvonnet, L. Xia, G. Li, Topology optimization of particle-matrix composites for optimal, fracture resistance taking into account interfacial damage, **International Journal for Numerical Methods in Engineering**, 115(5):604-626, 2018.
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[A62] M.G.D. Geers, J. Yvonnet, Multiscale Modeling of Microstructure-Property Relations, **MRS Bulletin**, 41(08):610-616, 2016.
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[A19] To Q.D., He Q.-C., Cossavella M., Morcant K., Panait A., Yvonnet J., Glass tempering and failure analysis of tempered glass structures with pin-loaded joints, **Materials and Design**, 29(5), 943-951 (2008)
[A18] Cosson B., Chevalier L., Yvonnet J., Simulation du procédé de soufflage par la méthode des éléments naturels contraints (C-NEM): application à l'optimisation du procédé, **Matériaux et Techniques**, 96, 243-251 (2008)
[A17] Yvonnet J., Zahrouni H., Potier-Ferry M., A model reduction method for the post-buckling analysis of cellular microstructures, **Computer Methods in Applied Mechanics and Engineering**, 197, 265-280 (2007).

[A16] Alfaro I., Yvonnet J., Chinesta F., Cueto E., A study on the performances of natural-neighbour-based Galerkin methods, **International Journal for Numerical Methods in Engineering**, 71(12), 1436-1465 (2007).
[A15] To Q.D., He Q.-C., Cossavella M., Morcant K., Panait A., Yvonnet J., Failure analysis of a pin-loaded joint in tempered glass structures, **Engineering Failure Analysis**, 14, 841-850 (2007).
[A14] Yvonnet J., He Q.-C., The Reduced Model Multiscale Method (R3M) for the nonlinear homogenization of hyperelastic media at finite strains, **Journal of Computational Physics**, 223, 341-368 (2007).
[A13] Alfaro I., Yvonnet J., Cueto E., Chinesta F., Doblaré M., Meshless methods with application to metal forming, **Computer Methods in Applied Mechanics and Engineering**, 195(48-49), 6661-6675 (2006).
[A12] Yvonnet J., Coffignal G., Ryckelynck D., Lorong Ph., Chinesta F., A simple error indicator for meshfree methods based on natural neighbors, **Computers and Structures**, 84 (21) 1301-1312, (2006).
[A11] Illoul L.A., Yvonnet J., Chinesta F., Clenet S., Application of the natural element method to model moving electromagnetic devices, **IEEE Transactions on Magnetics**, 42(4) 727-730 (2006).
[A10] Yvonnet J., Villon P., Chinesta F., Natural Element approximations involving bubbles for treating incompressible media, **International Journal for Numerical Methods in Engineering**, 66(7), 1125—1152 (2006)
[A9] Yvonnet J., Umbrello D., Chinesta F., Micari F., A simple inverse procedure to determine heat flux on the tool in orthogonal cutting, **International Journal of Machining tools and manufacturing**, 46(7-8):820-827 (2006)
[A8] Lorong Ph., Yvonnet J., Coffignal G., Assouline S., Contribution of structural analysis in numerical simulation of machining and blanking : state-of-the-art, **Archives of Computational Methods in Engineering**, 13(1), 45—90. (2006)
[A7] Alfaro I., Yvonnet J., Cueto E., Chinesta F., Villon P., Doblaré M., Nouvelles avancées dans les méthodes sans maillage de type éléments naturels pour la simulation des procédés de mise en forme. **Revue Européenne de Mécanique Numérique** (anciennement Revue Européenne des Eléments Finis) (200) ; 15(1-2-3) :29-45.
[A6] Yvonnet J., Ryckelynck D., Lorong P., Chinesta F., Simulating thermo-elasto-plasticity in large transformations with adaptive refinement in the natural element method: application to shear banding, **International Journal of Forming Processes**, 8, 347-363 (2005).
[A5] Yvonnet J., Chinesta F., Ryckelynck D., Lorong Ph., The constrained natural element method (C-NEM) for treating thermal models involving moving interfaces, **International Journal of Thermal Sciences**, 44, 559-569 (2005).
[A4] Sukumar N., Dolbow J., Devan A., Yvonnet J., Chinesta F., Ryckelynck D., Lorong P., Alfaro I., Martinez M.A., Cueto E., Doblaré M.. Meshless methods and partition of unity finite elements, **International Journal of forming processes**, 8 (4), 409-427 (2005).
[A3] Yvonnet J., Ryckelynck D., Lorong P., Chinesta F., A new extension of the natural element method for non convex and discontinuous domains : the constrained natural element method (C-NEM), **International Journal for Numerical Methods in Engineering**, 60, 1451-1474 (2004).
[A2] Chinesta F., Lorong Ph., Ryckelynck D., Martinez M. A., Cueto E., Doblaré M., Coffignal G., Touratier M., Yvonnet J., Thermomecanical cutting model discretisation : eulerian or lagrangian, mesh or meshless ?, **International Journal of forming processes**, 7 (2), 83 – 97 (2004).
[A1] Yvonnet J., Ryckelynck D., Lorong P., Chinesta F., Interpolation naturelle sur les domaines non convexes par l'utilisation du diagramme de Voronoï contraint : méthode des éléments C-naturels, **Revue Européenne de Mécanique Numérique** (2003) ; 13: 487 – 509.

BOOK CHAPTERS

[B9] X. Lu, J. Yvonnet, F. Detrez, J. Bai, Modélisation électromécanique non linéaire multi-échelle de nanocomposites graphène-polymère, In: Nanocomposites, préparation, caractérisation et modélisation, J. Bai (Ed), ISTE-Wiley, 2021.
[B8] T.T. Nguyen, J. Yvonnet, M. Bornert, C. Château, Modeling of Complex Microcracking in Quasi-Brittle Materials: Numerical Methods and Experimental Validations, In: Advances in Multi-Physics and Multi-Scale Couplings in Geo-Environmental Mechanics, F. Nicot, O. Millet (Eds), Wiley, 2017.
[B7] M.G.D. Geers, V. Kouznetsova, K. Matous, J. Yvonnet, Homogenization methods and multiscale modeling: non-linear problems, In: Encyclopedia of Computational Mechanics, E. Stein, R. de Borst, T.J.R. Hughes (eds.), Wiley, 2016.
[B6] Yvonnet J., He Q.-C., Monteiro E., Tran A.B., Toulemonde C., Sanahuja C., Clément A., Soize C., Non-concurrent computational homogenization of nonlinear, stochastic and viscoelastic materials, dans Handbook of Micromechanics and Nanomechanics, S. Li and X.-L Gao (eds.), Pan Stanford, 2013.
[B5] Chinesta F., Yvonnet, J., Villon P., Breitkopf P., Joyot P., Alfaro I., Cueto E., New Advances in meshless methods : Coupling natural element and moving least square techniques, dans Advances in Meshfree Techniques, Computational Methods in Applied Sciences, 5, 97-121, V.M.A. Leitao, C.J.S. Alves, Duarte C., eds., 2007.
[B4] Chinesta F., Yvonnet J., Villon P., Breitkopf , P., Joyot P., Alfaro I., Cueto E., Nouvelles avancées dans les méthodes sans maillage : le couplage des techniques éléments naturels et moindres carrés mobiles dans Modélisation Numérique – Défis et Perspectives, P. Breitkopf, C. Knopf-Lenoir, Hermès Science, 2007.
[B3] Yvonnet J., Villon P., Chinesta F., Natural element approximations involving bubbles for treating incompressible media, ??, dans Lecture Notes in Computational Science and Engineering. Meshfree Methods for Partial Differential Equations III, 54, Michael Griebel and Marc A. Schweitzer, Springer Verlag, 2007.
[B2] Yvonnet J., Lorong P., Ryckelynck D., Chinesta F., Coffignal G., Nouvelles avancées dans les méthodes sans maillage basées sur les éléments naturels contraints pour la simulation des procédés, dans Extensions et Alternatives à la Méthode des Eléments Finis, Piotr Breitkopf, Hermès Science, 2006.
[B1] Yvonnet J., Ryckelynck D., Lorong P., Chinesta F., Treating moving interfaces in thermal models with the C-NEM, 255 – 270, dans Lecture Notes in Computational Science and Engineering. Meshfree Methods for Partial Differential Equations II, Michael Griebel and Marc A. Schweitzer, Springer Verlag 2005.

PROFESSIONAL SERVICE ACTIVITIES

[4] 2026- Elected member of the IACM Executive Council (International Association for Computational Mechanics)
[3] 2024 –2026: President of CSMA (French Computational Structural Mechanics Association)
[2] 2017-2026: Elected member of the administrative board of CSMA (French Computational Structural Mechanics Association)
[1] 2017 – Member of the General Council of IACM (International Association for Computational Mechanics)

INVITED LECTURES IN NTERNATIONAL OR NATIONAL CONFERENCES

Plenary lectures

[6] J. Yvonnet, Machine learning-based multiscale fracture, European Mechanics of Materials Conferences – Euromech (EMMC 20), Florence, Italy, 27-29 May 2026
[5] J. Yvonnet, Machine learning-based multiscale fracture modelling, 1st Hellenic-Italian Conference on Computational Mechanics, Biomechanics and Mechanics of Materials (HICOMP), Rhodes Island, Greece, 19-21 June, 2025.
[4] J. Yvonnet, ECCOMAS Reduced order models for fracture and path-dependent multiscale simulations: Macro Clustering and data-driven approaches, 6th International Workshop on Model reduction Techniques (MORTECH), Paris Saclay, 22-24 November 2023, France.
[3] J. Yvonnet, Microfissuration des matériaux hétérogènes, 15e colloque national en calcul des structures, Giens, France , May 16-22, 2022
[2] J. Yvonnet, Microcracking in heterogeneous materials, 8th international conference on "Advanced COmputational Methods in Engineering (ACOMEN)" Liège, Belgium, August 31- September 2, 2022.
[1] Numerical modeling of fracture in highly heterogeneous materials, XXXIX Ibero-Latin American Congress on Computational Methods in Engineering (CILAMCE 2018), Compiègne, France, 11-14 November 2018.

Semi-plenary lecture

[2] J. Yvonnet, Machine learning-based multiscale fracture, 3rd IACM Digital Twins in Engineering Conference (DTE 2025) & 1st ECCOMAS Artificial Intelligence and Computational Methods in Applied Science (AICOMAS 2025), Paris, 17-21 February 2025, France.

[1] Computational homogenization of micro and nano-structured materials, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.

Keynote lectures and invited lectures: see complete list of publications

CONTRACTS AND GRANTS (funded)

<u>As PI or co-PI :</u>

[22] PI – Safran Aircraft Engines, contrat d'accompagnement stage master (2026), Microscopic and damage behavior of carbon fiber tows in fiber-reinforced polymers» : 32 k€

[21] PI – Safran Aircraft Engines, One-year study (2024) Numerical modelling of damage in 3D woven composites» : 32 k€

[20] **PI** – Safran Aircraft Engines, ONERA, PhD contract (2023-2026) Arthur MONTAZEL PhD thesis, « Progressive damage in woven composites » : 60 k€

[19] **PI** – ALTAIR, « Multi-scale modeling of compressive damage in 3D printed architected lattices» : 10 k€

[18] **PI** – SAFRAN, phD thesis Ali KETATA, « Adaptive and controlled multi-scale analysis of industrial structures» : 60 k€

[17] **PI**– CEA/Orano, Post-doc Amine Benaimeche «Modeling and simulation of the mechanical effects of internal expansion due to corrosion of metal inclusions in cementitious matrices» : 15k€ (co-auteurs, Qi-Chang He, Benoit Bary)

[16] **PI** – Bosch Research Foundation (2021-2023) Thesis Hamid Reza Madadi « Artificial Intelligence and Computational Material Science – AI Based Two Scale Homogenization» : 186k€

[15] **PI** – CEA/Orano, research contract (2020-2021) Thèse Amine Benaimeche « modeling and simulation of mechanical swelling effects due to corrosion of metallic inclusions in cementitious matrices » : 18k€ (co-auteurs, Qi-Chang He, Benoit Bary)

[14] **PI** – Naval Group, research contract (2019-2020) « Modeling of ablative materials : XFEM and Phase field approaches» : 20 k€

[13] **PI** – Naval Group, research contract (2018-2019) « multiscale modeling of porous elastomers with computational homogenization» : 20 k€

[12] **PI** – Safrantech, PhD contract (2018-2021) Thèse Minh Vuong Le : « Multiscale modeling of composites with mesostructures gradients » : 60 k€

[11] **PI** - Saint Gobain (2016-2017) : «Modeling of microcracking in foamed plaster samples» : 7 k€

[10] **PI** – DCNS (2016-2017) : «Design of Structures based on sublattices» : 20 k€

[9] **PI** - ANR PRCE Project "MMELED" (2016-2020) « Multiscale modeling and experimental investigations of damage in composite workpieces obtained by 3D printing »: 620 k€

[8] **Co-PI** - NEEDS CNRS-CEA Project (2016-2018) « 3D mesoscopic simulations of microcracking and creep in concrete including cement paste/inclusions interfaces» : 9.5 k€ (co- authors: Qi-Chang He, Benoit Barry)

[7] **Co-PI** – EDF (2014-2017) Thèse Jean-Luc Adia «Multiscale modelling of creep and hydric phenomena in concrete materials » (co- author: Qi-Chang He) : 60 k€+110k€ (PhD)

[6] **Co-PI** – EDF (2012-2013), financement de post-doc : «Simulation of Stress Corrosion Cracking» (co- author: Qi-Chang He) : 55 k€

[5] **Co-PI** - PPS Université Paris-Est (2011-2013) "Quantum and continuum mechanics for modelling nanostructures » (co-author: C. Léonard): 190 k€

[4] **PI** – EUROBIOS (2010) Meshfree methods for simulation of transport in porous media: 7 k€

[3] **Co-PI** – EDF (2009-2010) : «Numerical methods of microstructures calculations obtained from microtomography images» (co- author: Guy Bonnet) : 20 k€

[2] **Co-PI** - EDF, (2008-2011) «XFEM/LEvel-set modelling of effective properties of concrete by taking into account the effects of the microstructure and imperfect interfaces» (co- author: Qi-Chang He) 60 k€+110k€ (PhD)

[1] **Co-PI** – EDF (2007-2008) : " XFEM/Level-set modeling of imperfect interfaces in concrete " (co-author: Qi-Chang He) : 20 k€

As participant

[2] ANR Project « TYCHE" (2011-2013) Advanced numerical methods using high dimensions stochastic modeling for quantification and propagation of uncertaintainties in solids and fluids mechanics » (Main investigator : C. Soize)
[1] ANR Project «MOSAIC» (2012-2015), "Stochastic modelling in nonlinear micromechanics" (Main investigator : J. Guilleminot)

VISITING POSITIONS

- Keio University, Japan, Prof. Mayu Muramatsu, March 2026
- Keio University, Japan, Prof. Mayu Muramatsu, January 2026
- Brown University, USA, Prof. Miguel BESSA, November 2023
- Brown University, USA, Prof. Miguel BESSA, March 2023
- IMT Lucca, Italy, Prof. Marco PAGGI, October 2022
- National Technical University of Athens, Greece, professor Vissarion PAPADOPOULOS, October 2021.
- Boston University, Boston, USA, professor Harold PARK, October 2019.
- University of California at Berkeley, USA, Professeur Tarek ZOHDI, October 2018.
- Huazhong University of Science and Technology, Wuhan, China, Prof. Liang XIA, March 2018
- The University of Houston, Texas, USA, Prof. Pradeep SHARMA, January 2016
- The University of Houston, Texas, USA, Prof. Pradeep SHARMA, December 2014
- The University of Houston, Texas, USA, Prof. Pradeep SHARMA, March 2014
- Peking University, College of Engineering (China), Prof. Huiling DUAN, November 2012
- National University of Singapore (NUS), Singapore, Prof. Vincent TAN, Novembre 2011
- National University of Singapore (NUS), Singapore, Prof. Vincent TAN, March 2011
- Peking University, College of Engineering (China), Prof. Huiling DUAN, Octobre 2010
- Peking University, College of Engineering (China), Prof. Huiling DUAN, Octobre 2008
- The University of Saragoza (Spain), Prof. M. Doblaré et Francisco Chinesta, December 2005

SHORT COURSES TAUGHT

- Introduction to numerical homogenization using finite elements, 17-21 January 2022, 2022, Colloque MECAMAT Matériaux architecturés, Aussois, France (Special invited course)
- Peking University, China: "An introduction to computational homogenization", 11 october 2010
- Peking University, China: "Numerical methods for the multiscale analysis of solids: an introduction", 14-15 October 2008

TEACHING

ENSAM Paris (2003-2005)
396 hours/year as temporary professor

- Nonlinear structures mechanics (graduate level)
- Computational thermodynamics (graduate level)
- Multiphysics coupling (graduate level)
- Engineers projects advising (graduate level)

Université Paris-Est Marne-la-Vallée (2005-)
196 hours/year as associate and full professor

- Advanced numerical methods (doctoral level)
- Machine learning for mechanics
- Introduction to numerical methods and Finite Elements
- Computational homogenization of heterogeneous materials (graduate level)
- Instabilities of structures (graduate level)
- Finite Elements and optimization (graduate level)
- Material selection for engineers (graduate level)
- Boundary value problems and Finite Elements (undergraduate level)
- Solid mechanics (undergraduate level)
- Strength of materials (undergraduate level)
- Materials Sciences (undergraduate level)
- Complex curves and surfaces (undergraduate level)
- Manufacturing technologies (undergraduate level)

ADVISING

Doctoral students supervised
4 ongoing PhD theses
25 defended PhD theses

- **TOKPANOU** Loukman (2026-)
- **ZEAITER** Nour (2024-)
- **LI** Zhonghua (2023-)
- **MONTAZEL Arthur** (2023-)
- **ABOU EID** Jana (2022-2025), How to connect the mechanical degradation of reinforced concrete structures to the corrosion process of the steel/concrete interface: measurements and 3D modelling
- **CHAFIA** Zakaria (2021-2024), Strategies for multiscale in numerical simulations to predict fracture behaviour in cementitious materials
- **KETATA** Ali (2021-2024), Adaptive and controlled multi-scale analysis of industrial structures
- **CHAOUCH** Souhail (2021-2024), Artificial Intelligence and Computational Material Science – AI Based Two-Scale Homogenization »

- **CHEN** Xing (2021-2024), « Topology optimization for energy harvesting systems based on piezoelectric composites"
- **WU** Yi (2017-2022) "Design and robust design of structure and material in dynamics via topology optimization"
- **BEGKOU** Franck (2020-2023) « Energy performance of printable concrete walls incorporating phase-change materials (PCMs) and plant fibers: experimental approach and modeling of thermo-hydric behavior"
  Co-advisor : Karim Benzarti (Univ Gustave Eiffel), M.A. Boudenne(Univ Paris-Est Creteil), A. Eddhahak (ENSAM Paris)
  Funding : LABEX MMCD
- **BENAIMECHE** Amine **(2018-2021)** « Modelling and simulation of mechanical swelling effects due to corrosion of metallic inclusions in concrete matrices »
- Co-advisor : Qi-Chang HE (Univ. Paris Gustave Eiffel, MSME)
- Funding : CEA/ORANO
- **LE** Minh Vuong **(2017-2020)** « Multiscale modeling of structure with gradient of properties »
- **LI** Pengfei **(2017-2020)** « Multiscale numerical modeling and experimental investigation of damage in 3D-printed polymer-glass composites »
- **HUN Darith-Anthony (2016-2020)** « Multiscale modeling of hydric drying-induced cracking: computational modeling, experimental validations and stochastic models »
  Defended 28 May, 2020
  Co-adviser : J. Guilleminot (Duke University, USA), M. Bornert (Ecole des Ponts PArisTech)
  Funding: LABEX MMCD
- **NGUYEN Nhu (2016-2019)** « Multiscale modeling of fracture in quasi brittle materials »
  Defended 19 April, 2019
  Funding: Vietnamian government
- **KODJO Jérôme (2015-2019)** « Multiscale modeling of concrete incorporating thermal phase change particles »
  Co-advisors : K. Sab (Navier, ENPC), M. Karkri (CERTES, Univ-Paris-Est Créteil)
  Funding : Labex MMCD
- **DA Daicong (2016-2018)** « Topological homogenization in heterogeneous materials"
  Funding: Chinese Scholarship Council
- **ADIA Jean-Luc (2014-)** "Multiscale modelling of shrinkage and creep effects in cementitious materials»
  Co-advisor : Qi-Chang HE (Univ. Paris-Est MLV, MSME)
  Funding : EDF R&D
- **LU Xioxin (2014-2017)** « Multiscale electro-mechanical modeling of graphene/polymer nanocomposites"
  Co-advisor : J. Bai (Ecole Centrale de Paris), Fabrice Detrez (Univ. Paris-Est MLV, MSME)
  Funding : (Ecole Centrale de Paris)
- **HOANG Trung Hieu (2012-2015)** « Incremental computational homogenization approaches for elastoplastic and viscoplastic heterogeneous structures calculations»
  Co-advisor : M. Guerich (Ecole Supérieure d'Ingénieurs Léonard de Vinci)
  Funding : Ecole supérieure d'ingénieurs Léonard de Vinci
- **NGUYEN Thanh Tung (**2012-2015) «Approaches combining imagery and numerical simulation for study of cement-based materials»
  Co-advising : M. Bornert, (Navier, ENPC), Q.-Z. Zhu, (Univ. Paris-Est MLV, MSME)
  Funding : LABEX MMCD

- **HOANG Minh Tuan (2011-2014),** « Multiscale modelling of piezoelectrical nanostructures»
  Co-advising : G. Chambaud (Univ. Paris-Est MLV, MSME), A. Mitrushchenkov (Univ. Paris-Est MLV, MSME)
  Funding: PPS project Univ. Paris-Est MLV.
- **LE Ba Anh (2010-2014)** « Computational homogenization of elastoplastic heterogeneous materials »
  Defended 24 January, 2014
  Co-adviser : Q.-C. He (Univ. Paris-Est MLV)
  Funding: Grant from Univ. Paris-Est MLV
- **CONG Yu (2011-2014) « Multiscale modelling of heterogeneous shells with micro and nano structures** »
  Defended 6 December, 2013
  Co-advising : H. Zahrouni (Université de Lorraine, LEM3)
  Funding: Grant from Univ. Lorraine
- **TRAN Anh Binh (2008-2011) «** Development of multiscale computational methods for heterogeneous elastic and viscoelastic structures »
  Defended 13 October, 2011
  Co-adviser: Q.-C. He (Univ. Paris-Est MLV)
  Funding: EDF R&D
- **MONTEIRO Eric (2006-2010) «** Contributions to computational methods for treating nonlinearities and discontinuities in heterogeneous materials »
  Defended 11 March, 2010
  Co-adviser: Q.-C. He (Univ. Paris-Est MLV)
  Funding: Grant from Univ. Paris-Est MLV
- **NEZAMABADI Saeid (2005-2009)** « Asympotical numerical method for the multiscale analysis of instabilities of structures »
  Defended 11 March, 2010
  Co-adviser: H. Zahrouni (Université de Lorraine, LEM3)
  Funding: Grant from Univ. Lorraine
  (Award for best PhD Thesis, Computational Structural Modeling Association, 2009)
- **TO Quy-Dong (2005-2009)** « Analysis and simulation of contact and damage in tempered glass structures »
  Defended 19 November, 2007
  Co-adviser: Q.-C. He (Univ. Paris-Est MLV)
  Funding: CSTB

Post-doctoral fellows advising

- Pavan Kumar (2021-2022)
  (co-advisors: Qi-Chanh He, Univ Gustave Eiffel, Marci Paggi, Univ IMT Lucca, Italy).
- Pengfei LI (2020)
- Liang XIA (2016-2017)
  Co-advisor: S. Ghabezloo, (NAVIER).
- Massoud SHAHROKHI (2015-2016)
  Co-advisor: C. Léonard (MSME), G. Stolz, V. Erhlacher (CERMICS)
- Amen TOGNEVI (2013-2015)

Co-advisors : M. Guerich (Ecole Supérieure d'Ingénieurs Léonard de Vinci), M. Karkri (CERTES Lab, Université Paris-Est Créteil, UPEC)

- Duc Hieu HOANG (2012-2013)
  Co-advising: Q.-C. He (Univ. Paris-Est MLV), C. Toulemonde (EDF R&D), T. Couvant (EDF R&D)
- Shui-Tao GU (2010-2011)
  Co-advising: Q.-C. He (Univ. Paris-Est MLV), A. Mitrushchenkiv (Univ. Paris-Est MLV)
- Qizhi ZHU (2008-2009)
  Co-advising: Q.-C. He (Univ. Paris-Est MLV),

Master students supervised

- D.T. LE « Modeling abaltive materials with XFEM and phase fields methods», Université Gustage Eiffel (2020)
- D.M. Tran, «Computations on image-based models using multiscale approaches», Université Paris-Est (2019)
- M.V. Le, « Modeling of aircraft composites without scales separation", Université Paris-Est/SafranTech (2017)
- T. Zhang, «Modélisation de la fissuration dans les milieux poreux », Université Paris-Est/Saint Gobain Recherche (2016)
- Q. ZAN, «Modélisation et simulation numérique de la fissuration et de l'effondrement d'une matrice de gypse moussé », Université Paris-Est/Saint Gobain Recherche, 2015.
- D.A. HOANG, «Méthode de champs de phase pour la modélisation de l'endommagement des interfaces », Université Paris-Est, 2014.
- C. SHENG, «Calculs de microstructures complexes par éléments finis », Université Paris-Est, 2013.
- T.T. TRAN, «Homogénéisation numérique et modèles stochastiques pour les milieux hétérogènes sans séparation d'échelle », Université Paris-Est (2013)
- E. PETION, «Modélisation multi échelle numérique du fluage lié aux effets hydriques dans le béton », Université Paris-Est (2013)
- T.T. NGUYEN, "Développement de nouveaux schémas itératifs pour les calculs de microstructures obtenus à partir d'images de microtomographie", Université Paris-Est (2012)
- T.T. DANG, "Fissuration intergranulaire dans les milieux polycristallins par une approche XFEM/level-set", Université Paris-Est (2011)
- B.A. LE, "Homogénéisation de matériaux hétérogènes non linéaires par une approche numérique séquentielle à deux échelles", Université Paris-Est (2010)
- M.H. HA, "Calcul d'Estimateurs et de bornes de propriétés effectives d'échantillons de béton à partir d'images de tomographies", Université Paris-Est (2010)
- A. B. TRAN, « Modélisation par une approche de type XFEM/level-set des propriétés effectives des bétons avec la prise en compte de la microstructure granulaire et d'interfaces imparfaites », Université Paris-Est (2008)
- E. MONTEIRO, « Analyse de la diffusion non-linéaire dans les matériaux poreux par une approche multi-échelle », Université de Marne-la-Vallée (2006)
- T.H. PHUNG, « simulation numérique du soufflage des polymères par une méthode sans maillage », Université de Marne-la-Vallée. (2006)

- F. LEBEL « Etude du procédé RTM par différentes approches numériques », ENSAM Paris (2005)
- L.A. ILLOUL, « Extension de la méthode des éléments naturels contraints au cas 3D », ENSAM Paris (2004)

UNIVERSITY SERVICE ACTIVITIES

Université Paris-Est Marne-la-Vallée

- 2015 Committee of Research of UPEM
- 2012- Master coordinator, « Mechanics and Civil Engineering »
- 2012- LABEX MMCD executive committee
- 2012-2013 Chairman, recruitment committee
- 2008-2012 Master coordinator, « Projects in Civil Engineering »

PROFESSIONAL SERVICE ACTIVITIES

Associate editor in international journals

[2] 2026- International Journal for Multiscale Computational Engineering (Begel House)
Manuscripts management, including screening and submission to reviewers, and editorial decisions.

[1] 2025- Advanced Modeling and Simulation in Engineering Sciences (Springer)
Manuscripts management, including screening and submission to reviewers, and editorial decisions

Editorial board in international Journals

[11] 2025 - **Computational Particle Mechanics** (CPM)
Springer

[10] 2023 – **International Journal for Numerical Methods in Engineering** (IJNME) Wiley
https://onlinelibrary.wiley.com/page/journal/10970207/homepage/editorialboard.html

[9] 2023 - **Advanced Modeling and Simulation in Engineering Sciences (AMSES)**
Springer

[8] 2022 - **Computer Methods in Applied Mechanics and Engineering (CMAME)**
Elsevier
https://www.journals.elsevier.com/computer-methods-in-applied-mechanics-and-engineering/editorial-board

[7] 2020 - **International Journal for Multiscale Computational Engineering**
Begell House
https://www.begellhouse.com/journals/multiscale-computational-engineering/editorial.html

[6] 2020 - **Forces in Mechanics**
Elsevier
https://www.journals.elsevier.com/forces-in-mechanics/editorial-board

[5] 2020 - **Mechanics of Size-dependent materials**
Springer

[4] 2018 - **Springer Nature Applied Sciences (SNAS)**
Springer Nature
(Guest editor of the Topical collection «Computational multiscale modelling and analysis in engineering and mechanics"

[3] 2016 – **Journal of Micromechanics and Molecular Physics**
http://www.worldscientific.com/page/jmmp/editorial-board

[2] 2015 - **Multiscale Multiphysics Mechanics**
http://www.techno-press.org/renewal/?page=journal_info&journal=mmm#

[1] 2013-2017 **Journal of Computational Engineering**
http://www.hindawi.com/journals/jcompeng/editors/

Guest editor of special issues in international journals

[2] 2019 **Advanced Modeling and Simulation in Engineering Sciences**: special issue on: "Computational Modeling of Complex Materials Across the Scales"
(Guest editors: Julien Yvonnet, Paul Steinmann (Erlangen-Nurnberg University, Marc Geers (Technical University of Eindhoven), and Andrew McBride (Univ. Glasgow)

[1] 2019 - **Computational Mechanics** : special issue on « Data-Driven Modeling and Simulation: Theory, Methods, and Applications" (Guest editors: Wing Kam Liu, Northwestern University, George Karniadakis, Brown University,
Shaoqiang Tang, Peking University, Julien Yvonnet, Université Paris-Est

Organization of international or national scientific conferences

International conferences

[6] J. Yvonnet, M. Geers, P. Steinmann, D. Kochmann, A. McBride (Chairman and local organizer), ECCOMAS Thematic Conference, " Computational modeling of complex materials across the scales IV (CMCS2025)", Champs-sur-Marne, 13-16 mai, 2025.

[5] M. Geers, V. Kouznetsova, J. Yvonnet (Co-chairman), P. Steinmann, A. McBride, ECCOMAS Thematic Conference, " Computational modeling of complex materials across the scales III (CMCS2023)", Eindhoven, 10-13 October, 2023.

[4] A. McBride, P. Steinmann, J. Yvonnet (Co-chairman), M.G.C. Geers, ECCOMAS Thematic Conference, " Computational modeling of complex materials across the scales II (CMCS2019)", Glasgow, 1-4 October, 2019.

[3] J. Yvonnet (Chairman and local organizer), M.G.C. Geers, P. Steinmann, ECCOMAS Thematic Conference, " Computational modeling of complex materials across the scales I (CMCS2017)", Paris, 7-9 November, 2017.

[2] V. Kouznetsova, J. Yvonnet (co-chairman), C. Miehe, EUROMECH Colloquium 559, “Multi-scale Computational Methods for Bridging scales in materials and structures, Eindhoven, The Netherlands, 23-25 February, 2015

[1] J. Yvonnet (Chairman and local organizer), M.G.C. Geers, F. Feyel, EUROMECH Colloquium 537, "Multi-scale Computational Homogenization of Heterogeneous Structures and materials", Université Paris-Est Marne-la-Vallée, 26-28 March 2012.

National conferences

[2] J. Yvonnet (Co-organisateur principal), Gisèle Seginger, Colloque EVOLUTION de l’Institut Universitaire de France, Marne-la-Vallée, France, 23-25 Mai, 2023 (100 participants).

[1] J. Yvonnet (Président du comité scientifique), F. Feyel, M. Potier-Ferry (vice-présidents), H. Zahrouni (president du comité d’organisation), 14e colloque national en calcul des structures (CSMA2019)", Giens, Frane, 13-17 Mai, 2019 (400 participants).

As organizer of Minisymposia

[22] Minisymposium organizer (Julien Yvonnet, Patrice Cartraud, Régis Cottereau, Djimédo Kondo), MS Approches multi-échelles en mécanique des solides, Congrès Français de Mécanique (CFM 2025) 25-29 Août 2025, Metz, France.
[21] Minisymposium organizer (Julien yvonnet, Laurent stainier, Modesar Shakoor, and Kerstin Weinberg), MS AI, Model reduction and data-driven techniques for multiscale modelling of materials, structures and processes, Digital Twins in Engineering & Artificial Intelligence and Computational Methods in Applied Science, DTE - AICOMAS 2025 February 17-21, 2025, Paris, France
[20] Minisymposium organizer (J. Yvonnet, K. Terada, P. Wriggers, M.G.C. Geers, K. Matous, P. Steinmann), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, The 9th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2024, 3-7 June 2024, Lisbon, Portugal..
[19] Minisymposium organizer (J. Yvonnet, K. Terada, P. Wriggers, M.G.C. Geers, K. Matous, P. Steinmann), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, The 16th World Congress on Computational Mechanics (WCCM2024) and 4th Pan American Congress on Computational Mechanics (PANACM2024), Vancouver, Canada, 21-26 July, 2024.
[18] Minisymposium organizer (Julien Yvonnet, Patrice Cartraud, Régis Cottereau, Djimédo Kondo), MS Approches multi-échelles en mécanique des solides, Congrès Français de Mécanique (CFM 2022) 29 Août- 2 septembre 2022, Nantes, France.
[17] Minisymposium organizer (J. Yvonnet, K. Terada, P. Wriggers, M.G.C. Geers, K. Matous, P. Steinmann), MS Multiscale computational homogenization for bridging scales in the mechanics and

physics of complex materials, 15th World Congress on Computational Mechanics (WCCM-ECCOMAS) 31 July- 5 August 2022, Yokohama, Japan.
[16] Minisymposium organizer (J. Yvonnet, K. Terada, P. Wriggers, M.G.C. Geers, K. Matous, P. Steinmann), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, 8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMA2022) June 5-9, 2022, Oslo, Norway
[15] Minisymposium organizer (M.G.C. Geers, J. Yvonnet), Session Multi-scale plasticity, damage models & scale bridging, XVI International Conference on Computational Plasticity. Fundamentals and Applications - COMPLAS 2021, 7-10 September 202, Barcelona, Spain.
[14] Minisymposium organizer (J. Yvonnet, K. Terada, P. Wriggers, M.G.C. Geers, K. Matous, P. Steinmann), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, 14th World Congress on Computational Mechanics (WCCM-ECCOMAS) 11-15 January 2021, Paris, France, Virtual congress.
[13] Minisymposium organizer (J. Yvonnet, M.G.C. Geers, K. Terada, K. Matous), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, 13th World Congress on Computational Mechanics (**WCCM**) 2018, July 22-27, 2018, New-York, USA.
[12] Minisymposium organizer (J. Yvonnet, M.G.C. Geers, K. Terada), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, 6th European Conference on Computational Mechanics (**ECCM**) 2018, June 11-15, 2018, Glasgow, UK.
[11] Minisymposium organizer (J. Yvonnet, V. Kouznetsova, K. Terada, K. Matous), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, 14th US National Congress on Computational Mechanics (**USNCCM**) 2017, July 17-20 2017, Montreal, Canada.
[10] Minisymposium organizer (S. Brisard, J. Yvonnet), 2016 **Engineering Mechanics Institute International Conference** (EMI 2016), 25-27 October 2016, Metz, France.
[9] Minisymposium organizer (J. Yvonnet, M.G.D. Geers, K. Terada, P. Wriggers), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, VIIth European Congress on Computational Mechanics in Applied Sciences and Engineering (**ECCOMAS**) 2016, June 5-10 2016, Crete Island, Greece.
[8] Minisymposium organizer (J. Yvonnet, M.G.D. Geers, K. Terada, P. Wriggers, M. Cho), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, **USNCCM** 2015, July 26-30 2015, San Diego, USA.
[7] Minisymposium organizer (J. Yvonnet, M.G.D. Geers, K. Terada, P. Wriggers), MS Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, **WCCM** 2014, July 20-25 2014, Barcelona, Spain.
[6] Minisymposium organizer (H.L. Duan (Peking Univ. China), J. Yvonnet), MS 101 “Multi-scale modeling of surface effects in nanomaterials and heterostructures”, 5th Asia Pacific Congress on Computational Mechanics & 4th International Symposium on Computational Mechanics (**APCOM** 2013), 11-14 December 2013, Singapore.
[5] Minisymposium organizer (J. Yvonnet, V. Kouznetsova (Eindhoven University of Technology), K. Terada (Tohoku Univ., Japon), P. Wriggers (Leibniz Univ. Hannover, Germany), M. Cho (Univ. Séoul, South Korea)), Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, **USNCCM** 2013, July 22-25 2013, Rayleigh, USA
[4] Minisymposium organizer (J. Yvonnet, M. Geers (Eindhoven University of Technology), K. Terada (Tohoku Univ., Japon), P. Wriggers (Leibniz Univ. Hannover, Germany)), MS102 Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials, **ECCOMAS** 2012, September 10-14, 2012, Vienna, Austria.

[3] Minisymposium organizer (J. Yvonnet, K. Terada (Tohoku Univ., Japon), P. Wriggers (Leibniz Univ. Hannover, Germany), J. Fish (Univ. of Columbia, USA)), MS-075 -Multiscale Computational Homogenization For Bridging Scales In The Mechanics And Physics Of Complex Materials, **WCCM** 2012, 8-13, July 2012, Sao Paulo, Brazil.
[2] Minisymposium organizer (J. Yvonnet, M. Dao (M.I.T., USA), V. Tan (National University of Singapore, Singapour))- Special session: "Multiscale Computational Nanomechanics", Sixth **M.I.T. Conference** on Computational Fluid and Solid Mechanics, Massachusets Institute of Technology, June, 15-17, 2011, Cambridge, USA.
[1] Minisymposium organizer (J. Yvonnet, H.S. Park (University of Boston, USA), V. Tan (National University of Singapore, Singapour))- S25: "Multiscale methods for modelling surface effects on nanosystems and nanostructured materials", IV European Conference on Computational Mechanics (**ECCM** IV), May, 16-21, 2010, Paris, France.

As part of the scientific committee

[16] Congrès français de mécanique 2022, 29 août-2 septembre 2022, Nantes, France.
[15] XVII International Conference on Computational Plasticity, COMPLAS 2023, 5-7 September, 2023.
[14] CIGOS - the International Conference series on Geotechnics, Civil Engineering Works and Structures, Ha Long city, Vietnam, Oct. 28-29, 2021
[13] 1st IACM conference for machine learning and digital twins for computational science and engineering, San Diego, USA, Sept. 26-29, 2021.
[12] Construction Digitalisation for Sustainable Development: Transforming through Innovation (CDSD2020), Hanoï, Vietnam, October 2020.
[11] Innovation for Sustainable Infrastructures (**CIGOS 2019**), Hanoï, Vietnam, Oct. 31-Nov.1, 2019.
[10] 9th International Conference on Computational Methods (**ICCM2018**), Rome, Italy, August 6-10, 2018.
[9] The 13th World Congress on Computational Mechanics (**WCCM XIII**) / 2nd Pan American Congress on Computational Mechanics (PANACM II), New York, USA, July 22-27, 2018. [8] International scientific committee member, 2016 Engineering Mechanics Institute International Conference (**EMI** 2016), 25-27 October 2016, Metz, France.
[7] National scientific committee member, 13th Colloque en calcul de structures, **CSMA**, May 2017, Giens, France.
[6] International scientific committee member, The 10th international conference on Mechanics of Time Dependent Materials (**MTDM** 2016). http://mtdm2016.ensam.eu/node/42.
[5] International scientific committee member, The 6th International Conference on Computational Mechanics (**ICCM2015**, Auckland, New-Zealand, July 14-17, 2015.
[4] International scientific committee member, **ECCOMAS** Extended discretization methods (**X6DMS** 2015) Ferrara, Italy, 9-11 Septembre 2015.
[3] National scientific committee member, 12th Colloque en calcul de structures, **CSMA**, May 18-22, 2015, Giens, France.
[2] International committee member, The 5th International Conference on Computational Methods (**ICCM2014**), Cambridge, England, 28-30 Juillet 2014.
[1] International committee member, European Congress on Computational Methods in Applied Sciences and Engineering (**ECCOMAS**) Thematic conference : Composites with micro- and nano structures (CMNS) – Computational Modeling and Experiments (Liptvsky Mikulas, Slovakia, 28 – 31 Mai 2007).

Served as a reviewer for the following journals

Advanced Modeling and Simulation in Engineering Science
Chinese Physics Letters
Composites Sciences and Technology
Computational Materials Science
Computational Mechanics
Computer Methods in Applied Mechanics and Engineering
Comptes Rendus de Mécanique
Continuum Mechanics and Thermomechanics
European Journal of Computational Mechanics
European Journal of Environmental and Civil Engineering
European Journal of Mechanics –A/Solids
Engineering Computations
Finite Element in Analysis and Design
Interaction and Multiscale Mechanics
International Journal for Numerical Methods in Engineering
International Journal of Solids and Structures
Journal of Computational Physics
Journal of Engineering Mechanics
Journal of Mathematical Analysis and Applications
Journal of the Mechanics and Physics of Solids
Journal of Medical Engineering
Materials
Meccanica
Mechanics and Industry
Modeling and Simulation in Materials Science and Engineering
Multiscale Modeling and Simulation
Numerical Heat Transfer
Philosophical Magazine
Proceedings of the Royal Society A

COMMUNICATIONS IN INTERNATIONAL AND NATIONAL (FRENCH) CONFERENCES – FULL LIST

[182] (Plenary lecture) J. Yvonnet, Machine learning-based multiscale fracture, European Mechanics of Materials Conferences (EMMC 20), Florence, Italy, 27-29 May 2026.

[181] N. Zeaiter, J. Yvonnet, B. Bary, G. La Valle, Multiscale thermo-elastic homogenization of hydrating binders for nuclear waste storage application, EURO-C 2026, Seefeld in Tirol, Austria, 9’12 March 2026.

[180] J. Yvonnet, S. Chaouch, Apprentissage automatique non supervisé basé sur le regroupement pour accélérer les simulations multiéchelles non linéaires avec des variables internes, 26e Congrès Français de Mécanique, Metz, France, 25-29 aout 2025.
[179] Z. Chafia, J. Yvonnet, J. Bléyer, Méthode multi-échelle basée sur les données pour la simulation de l'endommagement anisotrope des structures hétérogènes, 26e Congrès Français de Mécanique, Metz, France, 25-29 aout 2025.
[178] Z. Chafia, J. Yvonnet, J. Bléyer, Data-Driven Based Multiscale Strategy for reducing Anisotropic Damage Computations in Heterogeneous Structures, 18th U.S. National Congress on Computational Mechanics (USNCCM18), Chicago, USA, July 20-24, 2025.
[177] A. Montazel, F. Laurin, J. Rannou, S. Mousillat, J. Yvonnet, Étude expérimentale de la rupture en compression de structures tissées 3D à matrice organique en présence d'effets d'échelle, Journées Nationales sur les Composites (JNC) 2025, 30 juin-2 juillet 2025, Gif-sur-Yvette, France.

[176] (Plenary lecture) J. Yvonnet, Machine learning-based multiscale fracture modelling, 1st Hellenic-Italian Conference on Computational Mechanics, Biomechanics and Mechanics of Materials (HICOMP), Rhodes Island, Greece, 19-21 June, 2025.

[175] Z. Chafia, J. Yvonnet, J. Bléyer, S. Vincent, S. El-Ouafa, Super-computer implementation of the phase field method to fracture for billion-degrees of freedom simulations in heterogeneous structures, The 8th International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2025), Porto, Portugal, 4-6 June, 2025.
[174] J. Yvonnet, A clustering approach to accelerate FE2 Anisotropic fracture simulations, ECCOMAS Thematic Conference: Computational Modeling of Complex Materials across the Scales, May 13-16, 2025, Champs-sur-Marne, France.

[173] A. Montazel, F. Laurin, J. Rannou, S. Mousillat, J. Yvonnet, Measurement of the compressive fracture toughness of 3d woven carbon fiber composites exhibiting size effects, COMPTEST 2025, 12th International Conference on Composite Testing and Model Identification, Riga, Latvia, 21-23 May, 2025.
[172] (Semi-Plenary lecture) J. Yvonnet, Machine learning-based multiscale fracture, 3rd IACM Digital Twins in Engineering Conference (DTE 2025) & 1st ECCOMAS Artificial Intelligence and Computational Methods in Applied Science (AICOMAS 2025), Paris, 17-21 February 2025, France.

[171] J. Yvonnet, P. Li, Qi-Chang, He, Machine-learning-based modelling of anisotropic damage from micro scale fracture simulations, EUROMECH COLLOQUIUM 642 International Colloquium on Multiscale and Multiphysics Modelling for Advanced and Sustainable Materials, September 23rd-27th 2024, Rome, Italy

[170] J. Yvonnet, P. Li, Qi-Chang He, Data-driven modelling of anisotropic damage from RVE fracture simulations, The 9th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2024, 3-7 June 2024, Lisbon, Portugal.

[169] S. Chaouch, J. Yvonnet, An unsupervised machine learning approach to reduce nonlinear FE2 multiscale calculations using macro clustering, The 9th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2024, 3-7 June 2024, Lisbon, Portugal.

[168] A. Ketata, J. Yvonnet, N. Feld, F. Detrez, Augustin Parret-Freaut, Heterogeneous structures computation with microstructure gradients using a homogenization approach with regularized relocalization, The 9th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2024, 3-7 June 2024, Lisbon, Portugal.

[167] Z. Chafia, J. Yvonnet, J. Bleyer, A machine learning based multiscale Approach to the prediction of the Anisotropic damage of structures, The 9th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2024, 3-7 June 2024, Lisbon, Portugal.

[166] S. Chaouch, J. Yvonnet, Réduction des calculs non-linéaires multi-échelles FE2 en utilisant un macro-clustering, CSMA 2024 16ème Colloque National en Calcul des Structures, 13-17 Mai 2024, Giens, France.

[165] X. Lu, F. Detrez, J. Yvonnet, J. Bai, Identification des propriétés élastiques locales des interfaces et interphases d'un nanocomposite polymère graphène, CSMA 2024 16ème Colloque National en Calcul des Structures, 13-17 Mai 2024, Giens, France.

[164] A. Ketata, J. Yvonnet, F. Detrez, N. Feld, A. Parret Freaut, Calcul de structures hétérogènes avec gradients de microstructure par une approche d'homogénéisation avec re-localisation régularisée, CSMA 2024 16ème Colloque National en Calcul des Structures, 13-17 Mai 2024, Giens, France.

[163] Z. Chafia, J. Yvonnet, J. Bleyer, Une approche multi-échelle basée sur les données pour la prédiction
de l'endommagement anisotrope des structures, CSMA 2024 16ème Colloque National en Calcul des Structures, 13-17 Mai 2024, Giens, France.

[162] Z. Chafia, J. Yvonnet, J. Bleyer, Machine learning-based multiscale approach to anisotropic damage in quasi-brittle heterogeneous structures, The 16th World Congress on Computational Mechanics (WCCM2024) and 4th Pan American Congress on Computational Mechanics (PANACM2024), Vancouver, Canada, 21-26 July, 2024.

[161] S. Chaouch, J. Yvonnet, J. Bleyer, Macro clustering for accelerating FE2 multiscale simulations of nonlinear composites considering elastoplasticity, viscoelasticity and damage, The 16th World Congress on Computational Mechanics (WCCM2024) and 4th Pan American Congress on Computational Mechanics (PANACM2024), Vancouver, Canada, 21-26 July, 2024.

[160] (Keynote Lecture) J. Yvonnet, Clustering methods for multiscale modelling of anisotropic damage, The 16th World Congress on Computational Mechanics (WCCM2024) and 4th Pan American Congress on Computational Mechanics (PANACM2024), Vancouver, Canada, 21-26 July, 2024.

[C159] (Plenary lecture) J. Yvonnet, ECCOMAS Reduced order models for fracture and path-dependent multiscale simulations: Macro Clustering and data-driven approaches, 6th International Workshop on Model reduction Techniques (MORTECH), Paris Saclay, 22-24 November 2023, France.

[C158] (Invited lecture) J. Yvonnet, Q.-C. He, P. Li, Data-driven harmonic analysis Damage modeling (DDHAD) for multi-scale modelling of anisotropic damage, Seventh International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2023), Prague, Czechia, 21-23 June, 2023.

[C157] (Invited lecture) J. Yvonnet, Unsupervised machine learning based on clustering for accelerating nonlinear multiscale simulations with internal variables, 14th International Symposium on Continuum Models and Discrete Systems, Paris, France – 26-30 June 2023.

[C156] S. Chaouch, J. Yvonnet, A k-means clustering FE2 method based on unsupervised machine learning for nonlinear multiscale calculations, XVII International conference on Computational Plasticity (COMPLAS), Barcelona, Spain, 5-7 September, 2023

[C155] J. Abou eid,, L. Adelaide, V. Bouteiiler, J. Yvonnet, Phase field modeling of corrosion-induced cracking in reinforced concrete structures, XVII International conference on Computational Plasticity (COMPLAS), Barcelona, Spain, 5-7 September, 2023

[C154] X. Chen, J. Yvonnet, S. Yao, Topology optimization of dynamic flexoelectric structures by isogeometric analysis, The 15th World Congress of Structural and Multidisciplinary Optimisation (WCSMO-15), Cork, Ireland 5th-9th June 2023

[C153] S. Chaouch, J. Yvonnet, An Unsupervised Machine Learning Approach to Reduce Nonlinear Multiscale Calculations Using Clustering, 17th U. S. National Congress on Computational Mechanics (USNCCM), Albuquerque, New Mexico, July 23-27, 2023

[C152] (invited lecture) J. Yvonnet, Q.-C. He, P. Li, Data-driven harmonic analysis for multi-scale construction of arbitrary anisotropic damage models with minimal number of internal variables, IUTAM Symposium on Data-Driven Mechanics, Paris, October 26-28, 2022.
[C151] (Plenary lecture) J. Yvonnet, Microcracking in heterogeneous materials, 8th international conference on "Advanced COmputational Methods in Engineering (ACOMEN)" Liège, Belgium, August 31- September 2, 2022.
[C150] J. Yvonnet, M.A. Benaimeche, S. Chaouch, B. Bary, Q.-C. He, Fast FE2 nonlinear multiscale simulations with loading path-dependent behaviors using k-means, June 5-9, 2022, The 8th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2022, Oslo, Norway.
[C149] (Plenary lecture) J. Yvonnet, Microfissuration des matériaux hétérogènes, 15e colloque national en calcul des structures, Giens, France , May 16-22, 2022
[C148] J. Yvonnet, Introduction à l'homogénéisation numérique par éléments finis, 17-21 January 2022, 2022, Colloque MECAMAT Matériaux architurés, Aussois, France (Special invited course)
[C147] J. Yvonnet, X. Lu, L. Papadopoulos, I. Kalogeris, V. Papadopoulos, A Stochastic FE2 Data-Driven Method for Nonlinear Multiscale Modeling, Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology, Sept. 26-29 2021, San Diego, USA (online participation)
[C146] M. A. Benaimeche, J. Yvonnet, B. Bary, Q.-C. He, Two-scale damage modeling in nuclear waste packages with phase field modeling of microcracking due to corrosion product expansion, XVI International Conference on Computational Plasticity, 7-9 Sept. 2021, Barcelona, Spain.

[C145] J. Yvonnet, P. Li, N. Nguyen, D. Hun, J. Guilleminot, Identification of macro phase field fracture models from micro and heterogeneous structure calculations, XVI International Conference on Computational Plasticity, 7-9 Sept. 2021, Barcelona, Spain (online participation)
[C144] P. Li, J. Yvonnet, C. Combescure, M. Nourai, H. Makich, An anisotropic elastoplastic phase field damage model for 3D printed materials and its experimental verification, XVI International Conference on Computational Plasticity, 7-9 Sept. 2021, Barcelona, Spain (online participation)
[C143] J. Yvonnet (invited lecture), Enhanced flexoelectricity in heterogeneous piezoelectric composites using topology optimization, IUTAM Symposium on IUTAM Symposium on Generalized continua emerging from microstructures, 19-23 July 2021, Paris, France.
[C142] P. Li, J. Yvonnet, C. Combescure, Phase-field modeling of anisotropic brittle fracture in directional porous polymer, 14th World Congress on Computational Mechanics (WCCM-ECCOMAS) 2021 –Virtual Congress 11-15 janvier 2021.
[C141] M. V-Le, J. Yvonnet, F. Detrez, N. Feld, coarse mesh condensation multiscale (CMCM) method for full-field simulation of nonlinear heterogeneous structures, 14th World Congress on Computational Mechanics (WCCM-ECCOMAS) 2021 –Virtual Congress 11-15 janvier 2021.
[C140] J. Yvonnet, recent advances in topology optimization of heterogeneous structures for fracture propagation resistance, 14th World Congress on Computational Mechanics (WCCM-ECCOMAS) 2021 –Virtual Congress 11-15 janvier 2021.
[C139] (invited lecture) J. Yvonnet, X. Lu, F. Detrez, J. Bai, A two-scale FE2 method using neural networks, MORTech 2019 - 5th international Workshop on Reduced Basis, POD and PGD Model Reduction Techniques, 20-22 Nov. 2019, Paris, France.

[C138] B. Haddag, I. Benchikh, M. Nouari, H. Makich, M. Bornert, J. Yvonnet, Identification des propriétés d'élasticité d'un polymère obtenu par fabrication additive SLS à partir d'une modélisation du volume élémentaire représentatif, 24ème Congrès Français de Mécanique, 26-30 août 2019, Brest, France.

[C137] (keynote lecture)J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Phase field method for microcracking simulations in concrete microstructure models obtained from 3D microtomography images, 10th International Conference on Fracture Mechanics of Concrete and Concrete Structures, FraMCoS-X, 23-26 juin 2019, Bayonne, France.

[C136] D.H. Hun, J. Guilleminot, J. Yvonnet, A. Dadda, A.M. Tang, M. Bornert, Computational modeling of crack propagation in a heterogeneous medium under drying conditions, Engineering Mechanics Institute 2019 (EMI) conference 18-21 June. 2019, Caltech, USA.
[C135] M.V. Le, J. Yvonnet, N. Feld, F. Detrez, The Reduced Condensation Domain Decomposition (RCDD) Method for simulations of heterogeneous structures, Engineering Mechanics Institute 2019 (EMI) conference 18-21 June. 2019, Caltech, USA.
[C134] T.T. Nguyen, J. Yvonnet, D. Waldmann, Phase field modeling of crack initiation and propagation under complex loading, VI International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2019), 12-14 June. 2019, Braunschweig, Germany.
[C133] T.T. Nguyen, J. Yvonnet, D. Waldmann, Q.C. He, Phase field modeling of interfacial crack propagation in quasi-brittle heterogeneous materials, VI International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2019), 12-14 June. 2019, Braunschweig, Germany.

[C132] D.Da, J. Yvonnet, L. Xia, Optimisation topologique de composites pour maximiser la résistance à la fracture, 14ème Colloque National en Calcul des Structures (CSMA 2019), 13-17 Mai 2019, Giens, France.
[C131] D.A. Hun, J. Yvonnet, J. Guilleminot, M. Bornert, Approche stochastique multi-échelles de la propagation de fissures dans les matériaux hétérogènes, 14ème Colloque National en Calcul des Structures (CSMA 2019), 13-17 Mai 2019, Giens, France.
[C130] M.V. Le, J. Yvonnet, N. Feld, F. Detrez, Une méthode Quasi-FE2 pour la résolution de structures composites, 14ème Colloque National en Calcul des Structures (CSMA 2019), 13-17 Mai 2019, Giens, France.
[C129] J. Yvonnet (Plenary lecture), Numerical modeling of fracture in highly heterogeneous materials, XXXIX Ibero-Latin American Congress on Computational Methods in Engineering (CILAMCE 2018), Compiègne, France, 11-14 November 2018.
[C128] N. Nguyen, J. Yvonnet, J. Rethoré, Macroscopic Models For Crack Propagation In Heterogeneous Lattices Based On Phase Field Method, 13th World Congress on Computational Mechanics, New York, USA, 22-27 July 2018.
[C127] K. Kodjo, J. Yvonnet, M. Karkri, K. Sab, Multiscale Thermomechanical Analysis of Composites Containing Phase Change Materials, 13th World Congress on Computational Mechanics, New York, USA, 22-27 July 2018.
[C126] D.-A. Hun, J. Guilleminot, J. Yvonnet, M. Bornert, Multi-scale Crack propagation in Random Heterogeneous media, 13th World Congress on Computational Mechanics, New York, USA, 22-27 July 2018.
[C125] J. Yvonnet, Topology optimization of particle-matrix composites for optimal fracture resistance, 13th World Congress on Computational Mechanics, New York, USA, 22-27 July 2018.
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