

Julien YVONNET

Birth date: July 18, 1978

Professor

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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	ENSAM² 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
2014-2019	Head of the Mechanical Group of the Multiscale Modelling and Simulation 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

- **99** 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 (January 2022)
Isi Web of Science: **2556**, h-index = **30**
Google Citations: **4175**, h-index = **37**
- **1** Monograph
- **9** book chapters
- **147** communications in national and international conferences
- **1** plenary conference in an international conference
- **1** semi-plenary conference in an international conference
- **29** keynotes and invited lectures in international conferences
- **49** invited lectures in seminars of international or national (French) Universities and in national thematic workshops
- Involved in the organization of **30** international conferences and local scientific events
- Member of the editorial board of **8** international journals
- **14** visiting positions (China, Singapore, USA, Spain, Greece)

- 17 funded contracts as PI or co –PI.
- 24 advised PhD theses including 18 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.

PAPERS IN REFERRED JOURNALS

- [99] Y. Wu, J. Yvonnet, P. Li, Topology optimization for enhanced dynamic fracture resistance of Structures, **Computer Methods in Applied Mechanics and Engineering**, accepted, 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. Benaïmeche, 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**, accepted, 2022.
- [95] D.-A. Hun, J. Yvonnet, J. Guillemot, A. Dadda, A.-M. Tang, M. Bornert, Desiccation cracking of heterogeneous clayey soil: experiments, modelling and simulations, **Engineering Fracture mechanics**, 258:108065, 2021.
- [94] P. Li, J. Yvonnet, C. Combescure, H. Makich, M. Nouari, Anisotropic elastoplastic phase field fracture modeling of 3D printed materials, **Computer Methods in Applied Mechanics and Engineering**, 386:114086, 2021.
- [93] X. Lu, F. Detrez, J. Yvonnet, J. Bai, Identification of elastic properties of interphase and interface In graphene-polymer nanocomposites by atomistic simulations, **Composites Science and Technology**, 213(8):108943, 2021.
- [A92] X. Chen, J. Yvonnet, S. Yao, H.S. Park, Enhanced converse flexoelectricity in piezoelectric composites by coupling topology optimization with homogenization, **Journal of Applied Physics**, 129:245104, 2021.
- [A91] X. Lu, J. Yvonnet, L. Papadopoulos, I. Kalogeris, V. Papadopoulos, A stochastic FE2 data-driven method for nonlinear multiscale modeling, **Materials**, 14(11): 2875, 2021.
- [A90] J.-L. Adia, J. Yvonnet, Q.-C. He, N.C. Tran, J. Sanahuja, A combined Lattice-Boltzmann-Finite Element approach to modeling unsaturated poroelastic behavior of heterogeneous media, **Journal of Computational Physics**, 437,110334, 2021.
- [A89] X. Chen, J. Yvonnet, S. Yao, H.S. Park, Topology optimization of flexoelectric composites using homogenization, **Computer Methods in Applied Mechanics and Engineering**, 381, 113819, 2021.
- [A88] P. Li, Y. Wu, J. Yvonnet, A SIMP-Phase field topology optimization framework to maximize quasi-brittle fracture resistance of 2D and 3D composites, **Theoretical and Applied Fracture Mechanics**, 114,102919.
- [A87] R. Hatano, S. Matsubara, S. Moroguchi, K. Terada, J. Yvonnet, FEr method with surrogate localization model for hyperelastic composite materials, **Advanced Modeling and Simulation in Engineering Sciences**, 7(1), 1-28, 2020.
- [A86] J. Yvonnet, X. Chen, P. Sharma, Apparent Flexoelectricity due to Heterogeneous Piezoelectricity, *Journal of Applied Mechanics*, 87(11): 111003, 2020.
- [A85] D. Da, J. Yvonnet, Topology Optimization for Maximizing the Fracture Resistance of Periodic Quasi-brittle Composites Structures, **Materials**, 13:3279, 2020.

- [A84] T.T. Nguyen, J. Yvonnet, D. Waldmann, Q.-C. He, Implementation of a new strain split to model unilateral contact within the phase field method, **International Journal for Numerical Methods in Engineering**, 121(21):4717-4733, 2020.
- [A83] M.-V. Le, J. Yvonnet, F. Detrez, N. Feld, Full-field elastic simulations for image-based heterogeneous structures with a Coarse Mesh Condensation Multiscale Method, **International Journal for Multiscale Computational Engineering**, 18(3):305-327, 2020.
- [A82] P. Li, J. Yvonnet, C. Combescure, An extension of the phase field method to model interactions between interfacial damage and brittle fracture in elastoplastic composites, **International Journal of Mechanical Sciences**, 179:105633, 2020.
- [A81] M.-V. Le, J. Yvonnet, N. Feld, F. Detrez, The Coarse Mesh Condensation Multiscale Method for parallel computation of heterogeneous linear structures without scale separation, **Computer Methods in Applied Mechanics**, 363: 112877, 2020.
- [A80] J. Yvonnet, N. Auffray, V. Monchiet, Computational second-order homogenization of materials with effective anisotropic strain-gradient behavior, **International Journal of Solids and Structures**, 191-192:434-448, 2020.
- [A79] V. Monchiet, N. Auffray, J. Yvonnet, Strain-gradient homogenization: a bridge between the asymptotic expansion and quadratic boundary condition methods, *Mechanics of Materials*, 143:103309, 2020.
- [A78] T.T. Nguyen, J. Yvonnet, D. Waldmann, Q.-C. He, Phase field modeling of interfacial damage in heterogeneous media with stiff and soft interphases, **Engineering Fracture Mechanics**, accepted 2019.
- [A77] D.A. Hun, J. Guilleminot, J. Yvonnet, M. Bornert, Stochastic Multi-Scale Modeling of Crack Propagation in Random Heterogeneous Media, **International Journal for Numerical Methods in Engineering**, 2019:1325-1344, 2019
- [A76] X. Lu, D. Giovanis, J. Yvonnet, V. Papadopoulos, F. Detrez, J. Bai, A data-driven computational homogenization method based on neural networks for the nonlinear anisotropic electrical response of graphene/polymer nanocomposites, **Computational Mechanics**, 64(2):307-321, 2019.
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- [A72] D. Da, J. Yvonnet, L. Xia, M.-V. Le, G. Li, Topology optimization of periodic lattice structures taking into account strain gradient, **Computers and Structures**, 210:28-40, 2018.
- [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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- [A68] L. Xia, D. Da, J. Yvonnet, Topology optimization for maximizing the fracture resistance of quasi-brittle composites, **Computer Methods in Applied Mechanics and Engineering**, 332:234-254, 2018.
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- [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)
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BOOK CHAPTERS

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[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

[2] 2017- 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 INTERNATIONAL CONFERENCES

Plenary lecture

[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

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

Keynote lectures

[10] J. Yvonnet, D. Da, L. Xia, G. Li, Topology optimization for maximizing the fracture resistance of quasi-brittle composites, 6th European Conference on Computational Mechanics (ECCM6), Glasgow, UK, 11-15 June 2018

[9] (Keynote lecture) J. Yvonnet, L. Xia, S. Ghabezloo, Phase Field Modeling of Hydraulic Fracturing with Interfacial Damage in Highly Heterogeneous Fluid-Saturated Porous Media, 14th US National Congress on Computational Mechanics, Montreal, Canada, July 17-20, 2017.

[8] (Keynote lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, L. Xia, Modelling of microcracking in image-based models of highly heterogeneous materials using the phase field method, 7th GACM Colloquium on Computational Mechanics, Stuttgart, Germany, 11-13 October, 2017.

[7] (Keynote Lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Q.Z. Zhu, "Phase field modeling of complex matrix/interfacial crack propagation in complex microstructures obtained from microtomography images", ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.

[6] (Keynote lecture) J. Yvonnet, B.A. Le, Q.-C. He, Neural networks for computational homogenization and optimization of hyperelastic heterogeneous materials, 13th US National Congress on Computational Methods (USNCCM 13), San Diego, USA, 26-30 July, 2015.

[5] (Keynote lecture) J. Yvonnet, Coarse-graining homogenization of heterogeneous media with non-separated scales, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.

[4] (Keynote lecture) M. T. Hoang, J. Yvonnet, G. Chambaud, A. Mitrushchenkov, Multiscale modeling of piezoelectric nanowires with surface effects based on ab initio calculations, 5th Asia Pacific Congress on Computational Mechanics and 4th International Symposium on Computational Mechanics, Singapore, December 11-14, 2013.

[3] (Keynote lecture) J. Yvonnet, T.T. Nguyen, V. Monchiet, Q.-Z. Zhu, A Fourier-free approach to solve linear and nonlinear microstructural problems defined over large grids of voxels, 12th US National Congress in Computational Mechanics (USNCCM12), Raleigh, USA, July 22-25, 2013.

[2] (Keynote lecture), Yvonnet J. Non-concurrent multiscale methods: a new trend for computational homogenization of nonlinear materials, 2nd International Workshops on Advances in Computational Mechanics, March 29-31, 2010, Yokohama, Japan

[1] (Keynote lecture) Yvonnet J., Lorong P., Ryckelynck D., Chinesta F. Investigations in shear band propagation using a natural neighbor meshfree approach, 7th. ESAFORM Conference on Material Forming, Trondheim, Norway, avril 2004.

Invited lectures

[16] (Invited lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Fissuration dans les microstructures de matériaux cimentaires : outils de simulation par la méthode de champ de phase, Colloque national MECAMAT Aussois « Matériaux Numériques », Aussois, France, 22-27 janvier 2018.

[15] (invited lecture) J. Yvonnet, T.T. Nguyen, L. Xia, M. Bornert, C. Chateau, Q.Z. Zhu, Modeling interactions between bulk and interfacial cracking in concrete microstructures with the phase field method, 3e journées Matériaux Numériques, Tours, France, 31 janvier-2 février 2017.

[14] (invited lecture) J. Yvonnet, Modeling interactions between bulk and interfacial cracking in concrete microstructures with the phase field method, Workshop "Regularized models of brittle fracture", Paris, France, 2 May 2016.

[13] (Invited lecture) J. Yvonnet, A. Tognoli, Guy Bonnet, M. Guerich, A filter-based computational homogenization method for problems with arbitrary scale separation, Workshop on Computational Mechanics of Generalized Continua and Applications to Materials with Microstructure, Catania, Italy, 29-31 October, 2015.

[12] (invited lecture) J. Yvonnet, A. Tognoli, G. Bonnet, M. Guerich, Filter-based computational homogenization, 1st Pan-American congress on computational mechanics, Buenos Aires, Argentina, 27-29 April, 2015.

[11] (Invited lecture) J. Yvonnet, G. Bonnet, «Coarse-graining/nonlocal homogenization of heterogeneous materials with arbitrary scale separation: a consistent scheme based on filters», IUTAM Symposium on Connecting Multiscale Mechanics to Complex Material, Evanston, Illinois, USA, May 14-16, 2014.

[10] (Invited lecture) J. Yvonnet, T.T. Nguyen, V. Monchiet, Q.-Z. Zhu, A fast method for solving microstructures problems with arbitrary contrasts defined on large grids of voxels without Fourier transform, ECCOMAS Coupled Problems in Sciences and Engineering (COUPLED 2013), Ibiza, Spain, June 17-19, 2013.

[9][INV11] (Invited lecture) J. Yvonnet, Q.-Z. Zhu V. Monchiet, A Lippmann-Schwinger method without Fourier transform to solve thermomechanical problems over voxels grids, ECCOMAS 2012, Vienna, Austria, September 10-14, 2012.

[8][INV10] (Invited lecture) J. Yvonnet, Q.-C. He, Q.-Z. Zhu, E. Monteiro, H. Le Quang, J.-F. Shao, S.-T. Gu, A XFEM framework for modeling heterogeneous media with interfacial energy and size-dependent properties, 10th World Congress on Computational Mechanics (WCCM 2012), São Paulo, Brazil, July 8-13, 2012.

[7] (Invited lecture) J. Yvonnet, M. Tuan Hoang, A. Mirtushchenkov, G. Chambaud, Multiscale modeling of piezoelectric nanowires, Fifth US-France symposia of the International Center for Applied Computational Mechanics (ICACM 2012), New-York, USA, June 11-13, 2012.

[6] (Invited lecture) J. Yvonnet, Alexander Mitrushchenkov, Qi-Chang He, Gilberte Chambaud, A multiscale procedure combining finite elements and ab initio calculations to model size-dependent mechanical properties of nanowires, 2nd International conference on Material Modeling (ICMM2), August 31st - September 2nd 2011, Paris

[5] (Invited lecture) Yvonnet J., Mitrushchenkov S., Chambaud G. A computational method for modelling size and surface effects in crystalline nanowires based on Finite Elements and Quantum mechanics, 16th US National Congress of Theoretical and Applied Mechanics, June 27-July 2, 2010, State College, USA.

[4] (Invited lecture) Yvonnet J., He Q.-C., Numerical homogenization of nonlinear media at finite strains using numerically explicit potentials, 10th US National Congress on Computational Mechanics (UNSCCM), 16-19 July, 2009, Columbus, USA.

[3] (Invited lecture) Yvonnet J., Gonzalez D., He Q.-C, A method using numerically explicit potentials for the homogenization of arbitrarily nonlinear anisotropic composites, ECCOMAS Thematic conference: Computational Methods for Coupled Problems in Science and Engineering (COUPLED), 8-10 June 2009, Ischia Island, Italy.

[2] (Invited lecture) Yvonnet J., He Q.-C., Monteiro E. On the use of model reduction for computational homogenization of non-linear micro and nano composites, Computational Modeling and Experiments of the Composites Materials with Micro and Nano Structures – CMNS 2007, Liptovský Mikuláš, Slovakia, may, 28-31, 2007.

[1] (Invited lecture) Yvonnet J., He Q.-C., Zahrouni H., Potier-Ferry M. The reduced model multiscale method for the nonlinear homogenization of hyperelastic media, IInd ECCOMAS international conference on Computational Methods for coupled problems in Science and Engineering – COUPLED PROBLEMS 2007, Ibiza, Spain, may, 21-23, 2007

CONTRACTS AND GRANTS (funded)

As PI or co-PI :

[17] **PI** – Safrantech, PhD contract (2021-2024) Ali KETATA PhD thesis, « Adaptive multiscale modelling of composite structures » : 60 k€

[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 uncertainties 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

- 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 ZOHDY, 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

- 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)
- 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

5 ongoing PhD theses

14 defended PhD theses

- **CHEN Xing** (2021-)
- **CHAOUCH Souhail** (2021-)
- **CHAFIA Zakaria** (2021-)
- **KETATA Ali** (2021-)
- **BEGKOU Franck** (2020-)
- **WU Yi** (2019-)
- **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: Vietnamese 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. Chabaud (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)** « Asymptotical 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. Ehlacher (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 abative materials with XFEM and phase fields methods», Université Gustave 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

Editorial board in international Journals

- [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

As main organizer

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

[4] J. Yvonnet (President of the Scientific Committee), F. Feyel, M. Potier-Ferry (vice-presidents), H. Zahrouni (president of local organization committee), **14e French National Computational Mechanics Congress (CSMA2019)**, Giens, France, 13-17 May, 2019.

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

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

[1] Chair and local organizer (J. Yvonnet, 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.

As organizer of Minisymposia

- [18] Minisymposium organizer (Julien Yvonnet, Patrice Cartraud, Régis Cottureau, 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 2021, 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, Massachusetts 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

[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 (**CDS2020**), Hanoi, Vietnam, October 2020.

[11] Innovation for Sustainable Infrastructures (**CIGOS 2019**), Hanoi, 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 (Liptovsky 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

[C151] J. Yvonnet, Microcracking in heterogeneous materials, August 31, September 2, 2022, 8th international conference on "Advanced Computational Methods in Engineering (ACOMEN)", Liège, Belgium (Plenary lecture)
[C150] J. Yvonnet, M.A. Benaïmeche, 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] J. Yvonnet, Microfissuration des matériaux hétérogènes, May 16-22, 2022, 15e colloque national en calcul des structures, Giens, France (Plenary lecture)

[C148] J. Yvonnet, Introduction à l'homogénéisation numérique par éléments finis, 17-21 January 2022, 2022, Colloque MECAMAT Matériaux architecturés, 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. Benaïmeche, 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 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.

[C124] M.V. Le, J. Yvonnet, N. Feld, F. Detrez, a filter-based multiscale homogenization method for composite structures without scale separation, 6th European Conference on Computational Mechanics (ECCM6), Glasgow, UK, 11-15 June 2018.

[C123] (**Keynote lecture**) J. Yvonnet, D.Da, L. Xia, G. Li, Topology optimization for maximizing the fracture resistance of quasi-brittle composites, 6th European Conference on Computational Mechanics (ECCM6), Glasgow, UK, 11-15 June 2018.

[C122] K. Kodjo, J. Yvonnet, K. Sab, M. Karkri, Concurrent two-scale analysis of composites embedding phase change particles, 16th European Mechanics of Materials Conference (EMMC16), Nantes, France, 26-28 March 2018.

[C121] (Invited lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Fissuration dans les microstructures de matériaux cimentaires : outils de simulation par la méthode de champ de phase, Colloque national MECAMAT Aussois « Matériaux Numériques », Aussois, France, 22-27 janvier 2018.

[C120] M.V. Le, J. Yvonnet, N. Feld, C. Combescure, filter-based computational homogenization Method for composites structures without Scale separation assumption, ECCOMAS Thematic Conference: Computational Modeling of Complex Materials across the Scales (CMCS 2017), 7-9 November 2017.

[C119] X. Lu, J. Yvonnet, F. Detrez, J. Bai, multiscale modeling of the electrical and mechanical properties of graphene-reinforced nanocomposites, ECCOMAS Thematic Conference: Computational Modeling of Complex Materials across the Scales (CMCS 2017), 7-9 November 2017.

[C118] N. Nguyen, J. Yvonnet, J. Rethoré, numerical identification of homogeneous phase field models to quasi-brittle fracture in heterogeneous periodic media, ECCOMAS Thematic Conference: Computational Modeling of Complex Materials across the Scales (CMCS 2017), 7-9 November 2017.

- [C117] K. Kodjo, J. Yvonnet, K. Sab, M. Karkri, thermomechanical modeling of materials embedding phase change particles, ECCOMAS Thematic Conference: Computational Modeling of Complex Materials across the Scales (CMCS 2017), 7-9 November 2017.
- [C116] (Keynote lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, L. Xia, Modelling of microcracking in image-based models of highly heterogeneous materials using the phase field method, 7th GACM Colloquium on Computational Mechanics, Stuttgart, Germany, 11-13 October, 2017.
- [C115] X. Lu, J. Yvonnet, F. Detrez, J. Bai, Computational Homogenization of the Nonlinear Electrical Behavior of Graphene/Polymer Nanocomposites, 14th US National Congress on Computational Mechanics, Montreal, Canada, July 17-20, 2017.
- [C114] (Keynote lecture) J. Yvonnet, L. Xia, S. Ghabezloo, Phase Field Modeling of Hydraulic Fracturing with Interfacial Damage in Highly Heterogeneous Fluid-Saturated Porous Media, 14th US National Congress on Computational Mechanics, Montreal, Canada, July 17-20, 2017.
- [C113] J-L. Adia, J. Yvonnet, Q.-C. He, N.-C. Tran, J. Sanahuja, Elastic shrinkage-swelling modeling in porous microstructures: a combined Finite Elements-Lattice Boltzmann-numerical approach. 6th Biot Conference on Poropomechanics, Paris, France, July 9-13 2017.
- [C112] N. Nguyen, J. Yvonnet, Multiscale, Phase field modeling of brittle cracking in heterogeneous materials, Fifth International conference on Computational Modeling of fracture of materials and structures, June 14-16, 2017.
- [C111] J. Yvonnet, L. Xia, S. Ghabezloo, Phase field modeling of hydraulic fracturing with interfacial damage in highly heterogeneous fluid-saturated porous media, Fifth International conference on Computational Modeling of fracture of materials and structures, June 14-16, 2017.
- [C110] J-L. Adia, J. Yvonnet, Q.-C. He, N.-C. Tran, J. Sanahuja, Incremental numerical homogenization of the aging viscoelasticity in unsaturated porous microstructures, VII International conference on Coupled problems in Science and Engineering, Rhodes Island; Greece, 12-14 June 2017.
- [C109] X. Lu, J. Yvonnet, F. Detrez, J. Bai, Computation of effective nonlinear coupled electro-mechanical properties of graphene-reinforced nanocomposites, VII International conference on Coupled problems in Science and Engineering, Rhodes Island; Greece, 12-14 June 2017.
- [C108] N. Nguyen, J. Yvonnet, Multiscale Phase field modeling of brittle cracking in heterogeneous materials, 13e Colloque national en calcul de structures, Giens, France, 15-19 mai 2017.
- [C107] J. Yvonnet, L. Xia, S. Ghabezloo, Phase field modeling of hydraulic fracture in heterogeneous media with interfacial damage, 13e Colloque national en calcul de structures, Giens, France, 15-19 mai 2017.
- [C106] (invited lecture) J. Yvonnet, T.T. Nguyen, L. Xia, M. Bornert, C. Chateau, Q.Z. Zhu, Modeling interactions between bulk and interfacial cracking in concrete microstructures with the phase field method, 3e journées Matériaux Numériques, Tours, France, 31 janvier-2 février 2017.
- [C105] L. Xia, J. Yvonnet, D. Da, Topology optimization of composite structures for fracture resistance with phase field modeling of crack propagation, 2th World Congress of Structural and Multidisciplinary Optimisation, Braunschweig, Germany, 5 - 9 June 2017. [C104] J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Phase field modeling of complex matrix/interfacial crack propagation in complex microstructures obtained from microtomography images, 2016 Engineering Mechanics Institute Conference, Metz, France, 25-27 octobre 2016.
- [C103] S. Nezamabadi, J. Yvonnet, A filter-based computational homogenization for nonlinear heterogeneous cellular media, 2016 Engineering Mechanics Institute Conference, 25-27 octobre 2016.
- [C102] J-L. Adia, J. Yvonnet, Q.-C. He, N.-C. Tran, J. Sanahuja, Numerical homogenization for unsaturated poroelasticity with surface tension effects. The International Conference on Technological Innovations in Nuclear Civil Engineering, Paris, France, 5-9 septembre 2016.

- [C101] L. Xia, J. Yvonnet, S. Ghabezloo, Phase field modeling of hydraulic fracture propagation in highly heterogeneous fluid-saturated porous media, The 15th European Mechanics of Materials Conference, Brussel, Belgium, 7-9 September 2016.
- [C100] T.T. Nguyen, J. Yvonnet, M. Bornert, C. Chateau, Q.-Z. Zhu, A phase-field method for computational modeling of interfacial damage interacting with crack propagation in realistic microstructures obtained by microtomography. The 12th World Congress on Computational Mechanics, Seoul, Korea, 24-29 July 2016.
- [C99] J.-L. Adia, J. Yvonnet, Q.-C. He, J. Sanahuja, N.-C. Tran, Unsaturated poromechanical behavior of cement-based materials, homogenized using direct numerical simulations, ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.
- [C98] X. Lu, J. Yvonnet, F. Detrez, J. Bai, A computational approach to quantify the electric conductivity of graphene-reinforced nanocomposites, ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.
- [C97] A. Tognevi, J. Yvonnet, M. Guerich, A multi-scale modeling method for heterogeneous structures without scale separation using a filter-based homogenization scheme, ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.
- [C96] T.H. Hoang, M. Guerich, J. Yvonnet, A New Numerical Incremental Homogenization Approach to Calculate Elastoplastic Heterogeneous Structures, ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.
- [C95] (Keynote Lecture) J. Yvonnet, T.T. Nguyen, M. Bornert, C. Chateau, Q.Z. Zhu, "Phase field modeling of complex matrix/interfacial crack propagation in complex microstructures obtained from microtomography images", ECCOMAS Congress 2016, Crete Island, Greece, 5-10 June 2016.
- [C94] (invited lecture) J. Yvonnet, Modeling interactions between bulk and interfacial cracking in concrete microstructures with the phase field method, Workshop "Regularized models of brittle fracture", Paris, France, 2 May 2016.
- [C93] J.-L. Adia, J. Yvonnet, Q.-C. He, J. Sanahuja, N.-C. Tran, Unsaturated poromechanical behavior of cement-based materials, homogenized using direct numerical simulations, The 10th International Conference on the Mechanics of Time Dependent Materials, Paris, France, 17-20 mai 2016.
- [C92] J. Yvonnet, A.B. Tran, Q.-C. He, J. Sanahuja, C. Toulemonde, A simple decoupled computational homogenization for linear heterogeneous viscoelastic materials, The 10th International Conference on the Mechanics of Time Dependent Materials, Paris, France, 17-20 mai 2016.
- [C91] M. Bornert, P. Aimeidieu, N. Lenoir, C. Chateau, T.T. Nguyen, J. Yvonnet, J.F. Bruchon, J.M. Pereira, M. Vandamme, P. Delage, Expérimentation hydro-mécanique in situ sous microtomographie: quelques applications en génie civil, XIe Colloque Rayons X & Matière, Grenoble, France, 1-4 décembre 2015.
- [C90] (Invited lecture) J Julien Yvonnet, A. Tognevi, Guy Bonnet, M. Guerich, A filter-based computational homogenization method for problems with arbitrary scale separation, Workshop on Computational Mechanics of Generalized Continua and Applications to Materials with Microstructure, Catania, Italy, 29-31 October, 2015.
- [C89] (Keynote lecture) J. Yvonnet, B.A. Le, Q.-C. He, Neural networks for computational homogenization and optimization of hyperelastic heterogeneous materials, 13th US National Congress on Computational Methods (USNCCM 13), San Diego, USA, 26-30 July, 2015.
- [C88] T.T. Nguyen, J. Yvonnet, Q.-Z. Zhu, M. Bornert, C. Chateau, Phase field modeling of complex microcracking in voxel-based models of cementitious materials, 13th US National Congress on Computational Methods (USNCCM 13), San Diego, USA, 26-30 July, 2015.
- [C87] A. Tognevi, M. Karkri, J. Yvonnet, M. Almaadeed, I. Krupa, Computational homogenization for the thermo-mechanical analysis of phase change composite materials, 18th International Conference on Composite Structures (ICCS18), Lisbonne, Portugal, 15-18 June, 2015.

- [C86] T.H. Hoang, M. Guerich, J. Yvonnet, Effective size of RVE for finite element analysis of structures made of nonlinear random composites, 18th International Conference on Composite Structures (ICCS18), Lisbonne, Portugal, 15-18 June, 2015.
- [C85] T.H. Hoang, M. Guerich, J. Yvonnet, An incremental multilevel computational homogenization method for elastoplastic composites, 18th International Conference on Composite Structures (ICCS18), Lisbonne, Portugal, 15-18 June, 2015.
- [C84] J. Yvonnet, A. Tognévi, G. Bonnet, M. Guerich, A filter-based computational homogenization method for handling non-separated scales problems, 12e Colloque National en Calcul des Structures, Presqu'île de Giens, 18-22 May, 2015.
- [C83] T.T. Nguyen, J. Yvonnet, Q.-Z. Zhu, M. Bornert, C. Chateau, Crack nucleation and propagation in highly heterogeneous microstructures models based on X-ray CT images of real materials, 12e Colloque National en Calcul des Structures, Presqu'île de Giens, 18-22 May, 2015.
- [C82] F. Detrez, J. Yvonnet, Q.-C. He, Multiscale modeling and molecular dynamics characterization of size-effects in thin films polymers, VI International Conference on Coupled Problems in Science and Engineering, San Servolo Island, Venice, Italy, 18-20 May, 2015.
- [C81], T.T. Nguyen, J. Yvonnet, M. Bornert, C. Chateau, A phase-field method for microcracking simulation in concrete microstructure models obtained from microtomography images, 1st Pan-American congress on computational mechanics, Buenos Aires, Argentina, 27-29 April, 2015.
- [C80] (invited lecture) J. Yvonnet, A. Tognévi, G. Bonnet, M. Guerich, Filter-based computational homogenization, 1st Pan-American congress on computational mechanics, Buenos Aires, Argentina, 27-29 April, 2015.
- [C79] J. Yvonnet, B.A. Le, Q.-C. He, Computational homogenization with Neural Networks, Euromech 559 "Multi-scale computational homogenization methods for bridging scales in materials and structures, Eindhoven, The Netherlands, 23-25 February, 2015.
- [C78] T.T. Nguyen, M. Bornert, C. Chateau, J. Yvonnet, Q.-Z. Zhu, 3D Detection of damage evolution in porous brittle cement based materials, 16th International Conference on Experimental Mechanics (ICEM16), Cambridge, 7-11 July, 2014.
- [C77] (Semi-plenary lecture) J. Yvonnet, Computational homogenization of micro and nano-structured materials: contributions to recent challenges, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.
- [C76] (Keynote lecture) J. Yvonnet, Coarse-graining homogenization of heterogeneous media with non-separated scales, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.
- [C75] A. Tognévi, M. Guerich, J. Yvonnet, Computational modeling of heterogeneous structures without scale separation: an approach based on nonlocal filter-based homogenization, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.
- [C74] T.T. Nguyen, J. Yvonnet, Q.-Z. Zhu, M. Bornert, C. Chateau, Crack nucleation and propagation in highly heterogeneous materials models obtained from microtomography images using phase field method, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.
- [C73] Y. Cong, S. Nezamabadi, H. Zahrouni, J. Yvonnet, multiscale modeling of shells with heterogeneous micro and nano structures, 11th World Congress on Computational Mechanics, Barcelona, 20-25 July, 2014.
- [C72] T.T. Nguyen, J. Yvonnet, Q.-Z. Zhu, M. Bornert, C. Chateau, A simplified and accelerated phase field method for crack nucleation and propagation in highly heterogeneous materials, 20th European Conference on Fracture, Trondheim, Norway, June 30- July 4, 2014.

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