

CURRICULUM VITÆ

NOELS Ludovic

PERSONAL DETAILS

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Office address Université de Liège, LTAS-CM3
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Date of birth February 10, 1977
Nationality Belgian
Scopus ID <https://www.scopus.com/authid/detail.uri?authorId=6602226226>
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Google Scholar <https://scholar.google.be/citations?user=Ad0QJ4AAAAAJ&hl=en>
Research Gate <https://www.researchgate.net/profile/Ludovic-Noels>
Unit Website <http://www.ltas-cm3.ULiege.ac.be/index.html>

EDUCATION & QUALIFICATION

- December 2004: Ph.D. in Applied Sciences “Contributions to energy-conserving time integration algorithms for non-linear dynamics”, Aerospace and Mechanical Engineering Department, University of Liège, Belgium
- June 2000: ElectroMechanical Engineering (Aerospace), University of Liège, Belgium

FORMER AND CURRENT POSITIONS

Since July 2021:

- Full Professor
- Aerospace and Mechanical Engineering Department (University of Liège)
- Head of Computational & Multi-scale Mechanics of Materials (CM3) unit

January 2015 – June 2021:

- Associate Professor
- Aerospace and Mechanical Engineering Department (University of Liège)
- Head of Computational & Multi-scale Mechanics of Materials (CM3) unit

October 2008 – December 2014:

- Assistant Professor
- Aerospace and Mechanical Engineering Department (University of Liège)
- Creation of LTAS- Computational & Multi-scale Mechanics of Materials (CM3)

January 2005 - August 2006:

- Postdoctoral associate at the Massachusetts Institute of Technology, Cambridge, USA
- Department of Aeronautics and Astronautics (Prof. R. Radovitzky)

October 2005 - September 2008:

- Research Scholar at the Belgian National Fund for Scientific Research (FNRS)
- Aerospace and Mechanical Engineering Department (University of Liège)
- LTAS-Continuum Mechanics and Thermo-mechanics (Prof. M. Hogge)

RESPONSIBLE FOR CLASSES

- APRI0004-1 Aerospace design project
- MECA0058-1 Fracture mechanics, damage and fatigue
- MECA0470-1 Alternative numerical methods in continuum mechanics
- MECA0028-1 Aircraft Structures

SUPERVISED PHD STUDENTS

- Kevin Spilker, “Clustering Analysis for the Micromechanics-Based Reduced Homogenization in the Mechanics of Composite Materials”, 7 December 2022.
- Nanda Gopala Kilingar, in co-supervision with Thierry Massart, Université Libre de Bruxelles, “Generation and data-driven upscaling of open foam representational volume elements”, 20 January 2021.
- Julien Leclerc, “A damage to crack transition framework for ductile materials”, 25 August 2020.
- Hussein Rappel, in co-supervision with Stéphane Bordas, University of Luxembourg “Model and parameter identification through Bayesian inference in solid mechanics”, 7 September 2018, L. Noels co-supervisor, S.P.A. Bordas, Supervisor (University of Luxembourg).
- Vinh Hoang Truong, “Stochastic multi-scale modeling MEMS stiction”, 19 September 2017.
- Lina Homsy, “Development of non-linear electro-thermo-mechanical discontinuous Galerkin formulations”, 24 May 2017.
- Vincent Lucas, “Stochastic multi-scale modeling of vibrating MEMS”, 29 August 2016.
- Vincent Péron-Lühns, “Development and numerical validation of a 2-scale computational model to study the mechanical behavior of nanocrystalline metals”, 15 May 2014.
- Van-Dung Nguyen, “Computational homogenization of cellular materials capturing micro-buckling, macro-localization and size effects”, 10 March 2014.
- Gauthier Becker, “Numerical simulations of brittle and elasto-plastic fracture for thin structures subjected to dynamic loadings”, 24 Mai 2012.
- Tymofii Khvan, “Nano-indentation for sub-miniaturized testing of irradiated materials: FEM analysis and experiments”, graduation scheduled for 2023.
- Soumianarayanan Vijayaraghavan, in co-supervision with Stéphane Bordas, University of Luxembourg “Machine learning for reduced-order-models and surrogate models of elastoplasticity”, graduation scheduled for 2023
- Juan Manuel Calleja Vázquez, “Stochastic Multiscale Analysis of Woven Composites Assisted by Machine learning”, graduation scheduled for 2023.
- Vinayak Gholap, “Multiphysics simulation of shape memory composites”, graduation scheduled for 2023.
- Mohib Mustafa in co-supervision with Javier Segurado, IMDEA Materials, “Stochatsic simulation of meta-materials”, graduation scheduled for 2024.
- Ujwal Kishore Jinaga, “Data Driven Modelling of Thick Composite Structures”, graduation scheduled for 2025.

GRANTS

European projects

- 2022-2026, ULiege administrator of “DIDEAROT- Digital Design strategies to certify and mAnufacture Robust cOmposite sTructures”, project 101056682 of the Horizon Europe Framework Program, 4 702 365€, CENAERO, SONACA SA, ULiege, Tecnalía, AERNNOVA (Spain), INEGI (Portugal), e-Xtsream (Luembourg), BSC (Spain)
- 2021-2024, ULiege administrator of “CARBOBRAKE- Development of a Thick-walled Carbon Fiber Reinforced Brake Caliper for High Performance Automotive Applications”, project 2010092 of the M.ERA-NET (H2020) 2020 call, 2 598 699€, GDTEch, MSC Software Belgium, ULiège (Belgium), iPoint, TUG, JKU, Secar Technologie (Austria), Fagor Arrasate, Ruimoldes (Spain)
- 2020-2024, Coordinator of “MOAMMM - Multi-scale Optimisation for Additive Manufacturing of fatigue resistant shock-absorbing MetaMaterials” project, H2020-EU.1.2.1. - FET Open program (Grant agreement ID: 862015), 3 516 831.25€, ULiege, UCL (Belgium), JKU (Austria), Imdea Materials (Spain), cirp Germany, www.moamm.eu
- 2015-2018, ULiege administrator of “STOMMMAC - STOchastic Multi-scale Modeling Methodologies for the Assessment of failure performance of Composite materials” project, M.ERA-NET (FP7) program (CT-INT 2013-03-28), 1 579 214€, e-Xstream S.A. (Belgium, coordinator), ULiege (Belgium), University of Luxembourg (Luxembourg), Johannes Kepler Universität (Austria), ACTION COMPOSITES GmbH (Austria), BATZ, S.Coop (Spain). “M-ERA.NET Success story” <https://m-era.net/success-stories>
- 2013-2016, Supervisor of Erasmus Mundus EPIC PhD scholarship “Development of non-linear electro-thermo-mechanical discontinuous Galerkin formulations”, Lina Homsí.
- 2012-2015, ULiege administrator of “3SMVIB - 3-Scale modelling for robust-design of vibrating micro sensors” project, MNT.ERA-NET (FP7) program, 1 497 000€, Open-Engineering (Belgium, coordinator), V2i, ULiège (Belgium), Technical University of Cluj-Napoca, National Research Institute for Development and Research in Microtechnology from Bucharest (Romania), Politechnika Warszawska (Poland)
- 2010-2013, ULiege administrator of “SIMUCOMP- Advanced Numerical Simulations of Inter- and Intralaminar Failures in Composites“ project, ERA-NET MATERA+ (FP7) program, 1 543 586€, IMDEA (Espagne, coordinator), E-Xtsream (Belgique), CENAERO (Belgique), ULiège (Belgique), Tudor (Luxembourg)
- 2009-2014, ULiege administrator of the Master Erasmus Mundus “THRUST”, KTH, AUTH, ULiege, DUKE

Regional (Walloon Region) projects

- 2021-2024, ULiege promotor of “Automation and Digitization of a Production Line of Upgraded cOmposites and application to an Industrial Security Solution- AD-CORSSI”, project 8511 of the GreenWin Walloon Centre, 2 952 949 €, Reprocover, GDTEch, A-Csys, Sirris, ULiège
- 2020-2023, ULiege administrator of “Virtual Braiding - VIBRA”, project 8422 of the 28th call of SkyWin Walloon Centre, 2 049 559 €, GDTEch, Open-Engineering, IsomateX, SABCA, Centexbel, ULiege

- 2018-2021, ULiege administrator of “Virtual Impact Sizing COmposites Structures - VISCOS”, project 7911 of the 21st call of SkyWin Walloon Centre, 3 322 000 €, SONACA, Isomatex, e-Xstream, UcL, ULiege
- 2017-2021, ULiege administrator of “EntroTough - Développement, optimisation et modélisation des alliages à haute entropie : vers l'émergence de nouveaux matériaux métalliques combinant ultra hautes résistance et ténacité” project WALInnov 1610154, 2 758 024€, UcL, ULB, ULiege
- 2016-2019, ULiege administrator of “MRIPF - Fracture Model for Impact, Penetration, and/or Fragmentation”, project 7581 of the MecaTech 16th call, 1 927 180 €, GDTech, Les Forges de Zeebrugge, Mear S.A., l'Université catholique de Louvain, UCL/iMMC/IMAP, Carat Duchatelet (Belgique)

F.N.R.S.-F.R.S. (Belgian National Fund for Scientific Research) projects

- 2019-2022, Supervisor of the Postdoctoral Researcher Grant “A Data-driven Computational Homogenization Method for damage-enhanced viscoelastic-viscoplastic Short-Fibers Reinforced Polymers”, V. D. Nguyen, ULiege
- 2019-2023, supervisor of the FNRS-FRIA PhD Grant “Multiphysics simulation of shape memory composites”, Vinayak Gholap, ULiege
- 2018-2022, supervisor of the FNRS-FRIA PhD Grant “Stochastic Multiscale Analysis of Woven Composites Assisted by Machine learning”, J. M. Calleja Vázquez, ULiege
- 2016-2020, ULiege administrator of “EnLightenIt - Multiscale modelling of lightweight metallic materials accounting for variability of geometrical and material properties” project FRFC T.0038.16, Belgian National Fund for research, Luxembourg National Fund for research, 394 000€, ULiege, ULB, Luxembourg National Fund for research, 250 000€, University of Luxembourg
- 2014-2018, coordinator of “Multiscale Fracture of Composite Laminates based on a Damage-Enhanced Mean-Field-Homogenization and a Damage to Crack Transition framework”, FRFC T.1015.14, Belgian National Fund for research, 520 000€, ULiege, UCL
- 2014-2017, supervisor of the FNRS-FRIA PhD Grant “Stochastic multi-scale modeling MEMS stiction”, V. Hoang Truong, ULiege
- 2011-2013, coordinator of “Modelling of damage to crack transition using a coupled discontinuous Galerkin/Cohesive zone method” (FSRD-11/01, 91 050€), ULiege
- 2011-2014, coordinator of “Robust Multi-Scale Design of MEMS“, FRFC 2.4508.11, Belgian National Fund for research, 136 355€, ULiege, UCL
- 2008-2012, supervisor of the FNRS-FRIA PhD Grant “Numerical simulations of brittle and elasto-plastic fracture for thin structures subjected to dynamic loadings”, G. Becker, ULiege

Others

- 2018-2022, ULiege promotor of “Nano-indentation for sub-miniaturized testing of irradiated materials: FEM analysis and experiments”, PhD fellowship, 172 000 €, Belgian Nuclear Research Centre (SCK•CEN)
- 2017-2023: Project coordinator of “ S3CM3-Synthesis, Characterization, and Multi-Scale Model of Smart composite Materials”, Actions de recherche concertées, ARC 17/21-07, 799 855 €, A&M (ULiege), EEI (ULiege), CERM (ULiege)
- 2009-2014, participant to “From Imaging to geometrical modelling of complex microstructured materials” (ARC 09/14-02), French Community of Belgium, 1 091 656€, ULiege

CONFERENCES AS PLENARY, SEMI-PLENARY LECTURE, KEYNOTES, AND ON INVITATION

- 12-14 June 2023: 5th International Conference on Uncertainty Quantification in Computational Science and Engineering (UNCECOMP 2023), “Development of History-Dependent Surrogate Models in the context of stochastic multi-scale simulations for elasto-plastic composites”, Athens, Greece, **Semi-Plenary Lecture**.
- 3-9 January 2023: International Conference on Plasticity, Damage, and Fracture 2023 (ICPDF 2023), “Redefinition of the interactions in deep-material-networks”, Punta Cana, Dominican Republic. **Keynote**.
- 1-4 October 2019: Computational modeling of Complex Materials across the Scales (CMCS 2019), “An inverse Mean-Field-Homogenization-based micro-mechanical model for stochastic multiscale simulations of unidirectional composites”, Glasgow, United Kingdom. **Distinguished Lecture on Invitation**.
- 12-14 March 2019: Euromech Colloquium 600 “New Challenges in Finite Element Technology – from the perspective of mechanics and mathematics”, “Damage to crack transition for ductile materials using a Cohesive-Band/Discontinuous Galerkin framework”, Aachen, Germany. **On invitation**.
- 22-27 July 2018, 13th World Congress on Computational Mechanics / 2nd Pan American Congress on Computational Mechanics, New York City, USA, “A Damage to Crack Transition Framework for Ductile Materials Accounting for Stress Triaxiality”. **Keynote**.
- 17-19 May 2018, 16th Youth Symposium on Experimental Solid Mechanics (YSESM18), Traunkirchen Monastery, Austria, “Computational Fracture Mechanics”. **Plenary Lecture**.
- 6-10 July 2015, 9th European Solid Mechanics Conference, ESMC15, Madrid, Spain, “A Non-Local Damage-Enhanced Incremental-Secant Mean-Field-Homogenization For Composite Laminate Failure Predictions. **Keynote**.
- 23-25 February 2015, “Propagation of uncertainties using probabilistic multi-scale models”, EUROMECH Colloquium 559 "Multi-scale computational methods for bridging scales in materials and structures", TU Eindhoven, The Netherlands. **Distinguished Lecture on Invitation**.
- 4-6 June 2014, “Multi-scale methods with strain-softening: damage-enhanced MFH for composite materials and computational homogenization for cellular materials with micro-buckling”, Instabilities Across the Scales (IAS) Symposium Cachan, France. **On invitation**.

INVITED LECTURES IN RESEARCH CENTERS AND UNIVERSITIES

- 8 December 2021, BRAIA Lecture Series on Technology Frontier, L. Wu, L. Noels. “A Recurrent Neural Network-based Surrogate Model for History-Dependent Multi-scale Simulations of Composite Materials”, Northwestern Polytechnical University, China.
- 4 November 2021: SimTech Seminar on Model Reduction and Data Techniques for Surrogate Modelling, L. Wu, L. Noels. “A Recurrent Neural Network-based Surrogate Model for History-Dependent Multi-scale Simulations”, University of Stuttgart, Germany, https://www.mib.uni-stuttgart.de/dae/video/mor_seminar_teaser.m4v.
- 5 July 2021: Materials for Medical Engineering Workshop, “A recurrent neural network-accelerated multi-scale model for elasto-plastic heterogeneous materials

subjected to random cyclic and non-proportional loading paths”, Johannes Kepler Universität Linz (JKU), Internationale Akademie Traunkirchen, Austria.

- 8 February 2021: Materials for Medical Engineering Workshop, “A recurrent neural network-accelerated multi-scale model for elasto-plastic heterogeneous materials subjected to random cyclic and non-proportional loading paths”, Johannes Kepler Universität Linz (JKU), Linz, Austria.
- 7 September 2018, Workshop on statistical approaches in mechanics, “A stochastic Mean-Field Reduced Order Model of Unidirectional Composites”, University of Luxembourg, Luxembourg
- 22 June 2018, SMMEG Seminar Series (engs solid mechanics seminars), “A stochastic Mean Field Homogenization model of Unidirectional composite materials”, Oxford University, United Kingdom
- 20 June 2016, “A stochastic 3-Scale approach to study the thermo-mechanical damping of MEMS”, Université du Luxembourg, Luxembourg
- 28 April 2014, “Instabilities through the length-scales”, Oxford Solid Mechanics, Oxford, United Kingdom
- 14 April 2014, “Multi-scale methods with strain-softening: damage-enhanced MFH for composite materials and computational homogenization for cellular materials with micro-buckling”, School of Aeronautics, Northwestern Polytechnical University, P.R. China
- 31 January 2014, “Homogenization with propagation of instabilities through the different scales”, UniGR-intermatGR-Workshop on Multiscale simulations
- 11 March 2013, “Homogenization strategies for non-linear engineered materials”, Oxford Solid Mechanics, Oxford, United Kingdom
- 24 November 2012, “Fracture of polycrystalline silicon MEMS”, Workshop on MEMS, University of Cluj- Napoca, Romania
- March 2012, “Non-linear mechanical solvers for GMSH”, UCL, Louvain La Neuve, Belgium
- September 2011, “Projects in Fracture Simulations”, CENAERO, Gosselie, Belgium
- January 2010, “Application of discontinuous Galerkin methods to shells and fracture of thin structures”, EPFL, Lausanne, Switzerland
- October 2009, “Discontinuous Galerkin methods for solid mechanics: Application to fracture, shells & strain gradient elasticity”, UGent, Gent, Belgium
- August 2009, “Discontinuous Galerkin methods for solid mechanics: Application to fracture, shells & strain gradient elasticity”, UFSC, Florianopolis, Brazil
- February 2005, “Simulation of crashworthiness problems with improved implicit time integration methods for non-linear dynamics”, MIT, USA

MEMBER OF PhD THESIS AND HABILITATION JURY

- 24 January 2022: M. Nawfal BLAL, “Matériaux numériques, design virtuel et mécanique computationnelle pilotée par les données”, INSA Lyon, France, Rapporteur (Habilitation à diriger des recherches)
- 17 September 2021: M. Fariborz GHAVAMIAN, “Accelerating finite element analysis using machine learning”, Delft University of Technology, the Netherlands
- 27 Mai 2021: M. Jean DI STASIO, “The CD-Lagrange scheme, a robust explicit time-integrator for impact dynamics: a new singular mass formulation, and an extension to deformable--deformable contact”, INSA Lyon, Lyon, France. Rapporteur

- 30 November 2020 : Ms. Anna HÖSSINGER-KALTEIS, “Modelling and Simulation of Polymeric Cellular Materials for Engineering Applications”, Johannes Kepler University Linz, Austria
- 3 June 2020: M. Arash GHAZI, “Microstructural computational modeling of the mechanical behaviour of closed-cell foams: from tessellation-based to CT scan-based modeling”, ULB, Belgique, - Técnico Lisboa, Portugal
- 9 April 2020: M. Hamid Reza BAYAT, “Failure modeling of interfaces and sheet metals”, Rheinisch-Westfälischen Technischen Hochschule Aachen, Germany
- 9 December 2019: M. Badadjida WINTIBA, “Automated procedures for the computational modeling of 3D woven composites”, ULB, Belgium
- 19 April 2019: Ms. Thi Hai Nhu NGUYEN, “Contributions to multiscale modelling of quasi-brittle damage in heterogeneous materials”, Université de Paris-Est, France
- 3 December 2018: M. Gerrit PIERREUX, “Evaluation of microdamage initiation in 3D reinforced composites by means of automated simulations”, ULB-VUB, Belgium
- 2 Mai 2017: Ms. Fatima-Ezzahra FEKAK, “Etude de la réponse dynamique des ponts roulants soumis à des chocs multiple pendant un séisme : Co-simulation implicite / explicite multi-échelle en temps pour la dynamique du contact”, INSA Lyon, France. Rapporteur
- 20 January 2017: Ms. Dongli LI, “Computational and experimental study of shock wave interactions with cells”, University of Oxford, Oxford, United Kingdom, Examiner
- 22 December 2016: M. Amin KARAMNEJAD, “Multiscale Computational Modeling of Brittle and Ductile Materials under Dynamic Loading”, TU Delft, The Netherlands
- 29 June 2016: M. Nsiampa NDOMPETELO, “Numerical Assessment of Non-Lethal Projectile Thoracic Impacts”, Ecole Royale Militaire, ULiège, Belgium
- 14 March 2016: M. Augusto Emmel SELKE, “Variational models of thermo-viscoelastic damage applications to polymer behavior and coupling with the Thick Level Set approach to nonlocal damage”, Ecole Centrale de Nantes, France
- 11 January 2016: Ms. Sarra HAOUALA, “Time and space (4D) homogenization for viscoelastic-viscoplastic solids under large numbers of cycles”, Ucl, Belgium
- 6 December 2015: M. Trung Hieu HOANG, “Approches d'homogénéisation numériques incrémentales pour le calcul des structures hétérogènes élasto-plastiques et élasto-visco-plastiques”, Université de Paris-Est, France, Rapporteur.
- 18 December 2014: M. Bernard SONON, “On advanced techniques for generation and discretization of the microstructure of complex heterogeneous materials” ULB, Belgium
- 17 December 2014: M. Teddy CHANTRAIT, “Approche multi-échelle en espace et en temps pour la prévision des endommagements dans les structures composites soumises à un impact de faible énergie”, ONERA/INSA Lyon, France. Rapporteur.
- 14 November 2008 : M. Paul-Emile Bernard, “Discontinuous Galerkin methods for geophysical flow modeling”, Ucl, Belgium

AWARDS

- AIAA Graduate design competition (second prize 2016-2017, 2017-2018, 2018-2019, 2019-2020 & 2021-2022, third prize 2020-2021), USA
- Award «des amis de l'Université de Liège (Prix Président André Leroux)» (Belgium, 2007)
- Best paper award at the 25th Army Science Conference, November 27-30 (USA, 2006)
- Fellowship award of the Massachusetts Institute of Technology (USA, 2003)

- AILg award for scientific publications (Belgium, 2003) and for the best thesis (Belgium, 2000)

ORGANIZATIONS OF INTERNATIONAL CONFERENCES

- 31 August-2 September 2022: 8th International Conference “Advanced COmputational Methods in ENgineering (ACOMEN 2022)”, Liège, Belgium.
- 14-17 November 2011: 5th International Conference “Advanced COmputational Methods in ENgineering (ACOMEN 2011)”, Liège, Belgium.
- 26-28 Mai 2008: 4th International Conference “Advanced COmputational Methods in ENgineering (ACOMEN 2008)”, Liège, Belgium.

COMMUNITY DUTIES

Expert at the Belgian Federal Agency for Nuclear Control (FANC)

- In the context of the cracks discovered in Doel 3 / Tihange 2 RPV

Reviewer for international journals:

- Advanced Engineering Materials, Advanced Modeling and Simulation in Engineering Sciences, Advances in Engineering Software, AIAA Journal, ASME Journal of Vibration and Acoustics, ASME Journal of Applied Mechanics, Composite Structures, Composites Part B, Computational Materials Science, Computer Method in Applied Mechanics and Engineering, Computers & Structures, Continuum Mechanics and Thermodynamics, European Journal of Mechanics - A/Solids, Experimental Mechanics, Finite Elements in Analysis and Design, International Journal for Numerical Methods in Engineering, International Journal of Computational Methods, International Journal of Solids and Structures, Inverse Problems in Science & Engineering, Journal of Applied Polymer Science, Journal of Computational and Applied Mathematics, Journal of Electromagnetic Waves and Applications, Journal of Mechanical Science and Technology, Journal of Micromechanics and Microengineering, Journal of Multiscale Modelling, Journal of the Mechanics and Physics of Solids, Mathematics and Computers in Simulation, Mechanics of Materials, Micromachines, Nanotechnology, Proceedings A of Royal Society, Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture, Scientific Reports –Nature, Theoretical and Applied Fracture Mechanics, Tribology international, Zeitschrift für Angewandte Mathematik und Mechanik.

Reviewer for research agencies

- ANR (National Research Agency, France)
- European Research Council (ERC, European Commission)
- Engineering and Physical Sciences Research Council (EPSRC, UK)
- M-ERA. NET network (European Commission) via Research Council of Norway
- Research Council Romania (National Research Agency, Romania)
- FNRS (National Research Agency, Belgium)
- Member of the FRIA panel (National Research Agency for PhD fellowship, Belgium)
- Research Council of Norway
- Poland National Science Centre
- Swiss National Science Foundation

LIST OF PUBLICATIONS
NOELS Ludovic
2022

PhD THESIS

Noels, L. (2004) Contributions to energy-conserving time integration algorithms for non-linear dynamics (in French). *University of Liège*, <https://hdl.handle.net/2268/402>

PhD THESES AS SUPERVISOR

1. Spilker, K. (2022). Clustering Analysis for the Micromechanics-Based Reduced Homogenization in the Mechanics of Composite Materials Unpublished doctoral thesis, ULiège - Université de Liège, Liege, Belgium, 2022. Jury: L. Noels (Promotor), L. Duchene, L. Wu, P. Camanho, I. Doghri, L. Adam, and E. Maillard. <https://hdl.handle.net/2268/296400>
2. Kilingar, N. G. (2021). *Generation and data-driven upscaling of open foam representational volume elements*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Massart, T. J. (Promotor), Gerard, P., Béchet, E., Geurts, P., Jung, A., Beex, L., & Berke, P. <https://hdl.handle.net/2268/252095>
3. Leclerc, J. (2020). *A damage to crack transition framework for ductile materials*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Habraken, A., Ponthot, J.-P., Wu, L., Pardoën, T., & Reese, S. <https://hdl.handle.net/2268/247753>
4. Rappel, H. (2018). *Model and parameter identification through Bayesian inference in solid mechanics*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Bordas, S. (Promotor), Wu, L., Beex, L., Needleman, A., & Hoefnagels, J. <https://hdl.handle.net/2268/227987>
5. Hoang Truong, V. (2017). *Stochastic multiscale modeling of MEMS stiction failure*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Golinval, J.-C., Alberto, C., Rochus, V., Arnst, M., & Wu, L. <https://hdl.handle.net/2268/214455>
6. Homsî, L. (2017). *Development of non-linear Electro-Thermo-Mechanical Discontinuous Galerkin formulations*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Geuzaine, C., Ponthot, J.-P., Béchet, E., Remacle, J.-F., & Chevaugéon, N. <https://hdl.handle.net/2268/211252>
7. Lucas, V. (2016). *Stochastic multi-scale modelling of MEMS*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Golinval, J.-C., Yvonnet, J., Vandepitte, D., Arnst, M., & Wu, L. <https://hdl.handle.net/2268/201815>
8. Péron, V. (2014). *Development and numerical validation of a 2-scale computational model to study the mechanical behavior of nanocrystalline metals*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Lecomte-Beckers, J., Ghosez, P., Sansoz, F., Stainier, L., Jérusalem, A., & Habraken, A. <https://hdl.handle.net/2268/168083>
9. Nguyen, V. D. (2014). *Computational homogenization of cellular materials capturing micro-buckling, macro-localization and size effects*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Ponthot, J.-P., Duysinx, P., Geuzaine, C., Béchet, E., Collin, F., Massart, T., & Kouznetsova, V. <https://hdl.handle.net/2268/159953>

10. Becker, G. (2012). *Numerical simulations of brittle and elasto-plastic fracture for thin structures subjected to dynamic loadings*. Unpublished doctoral thesis, ULiège - Université de Liège. Jury: Noels, L. (Promotor), Ponthot, J.-P., Radovitzky, R., Geuzaine, C., Béchet, E., Habraken, A., Stainier, L., Sener, J.-Y., Pardoën, T., & Wyart, E. <https://hdl.handle.net/2268/113142>

PUBLICATIONS IN PEER-REVIEWED INTERNATIONAL JOURNALS

1. Noels, L. (01 November 2022). Toward stochastic multi-scale methods in continuum solid mechanics. *Advances in Applied Mechanics*, 55. 254 pages. doi:10.1016/bs.aams.2022.03.001 <https://hdl.handle.net/2268/253001>
2. Hilhorst, A., Leclerc, J., Pardoën, T., Jacques, P. J., Noels, L., & Nguyen, V. D. (29 November 2022). Ductile fracture of high entropy alloys: From the design of an experimental campaign to the development of a micromechanics-based modeling framework. *Engineering Fracture Mechanics*, 275, 108844. doi:10.1016/j.engfracmech.2022.108844, <https://hdl.handle.net/2268/295292>
3. Spilker, K., Nguyen, V. D., Adam, L., Wu, L., & Noels, L. (01 September 2022). Piecewise-uniform homogenization of heterogeneous composites using a spatial decomposition based on inelastic micromechanics. *Composite Structures*, 295, 115836. doi:10.1016/j.compstruct.2022.115836, <https://hdl.handle.net/2268/291628>
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PROCEEDINGS OF INTERNATIONAL CONFERENCES

1. Hoang Truong, V., Paquay, S., Golinval, J.-C., Wu, L., Arnst, M., & Noels, L. (2016). A Stochastic Multi-scale Model For Predicting MEMS Stiction Failure. In *Proceedings of the SEM XIII International Congress and Exposition on Experimental and Applied Mechanics. (SEM XIII 2016)* (pp. 8), <https://hdl.handle.net/2268/200354>
2. Homsí, L., Geuzaine, C., & Noels, L. (2016). Numerical Properties of a Discontinuous Galerkin formulation for electro-thermal coupled problems. In M. Papadrakakis, V. Papadopoulos, G. Stefanou, & V. Plevris (Eds.), *Proceedings of the VII European Congress on Computational Methods in Applied Sciences and Engineering, Crete*

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3. Hoang Truong, V., Wu, L., Paquay, S., Golinval, J.-C., Arnst, M., & Noels, L. (2016). A Study Of Dry Stiction Phenomenon In MEMS Using A Computational Stochastic Multi-scale Methodology. In *EuroSimE 2016 in Montpellier* (pp. 4). IEEE. doi:10.1109/EuroSimE.2016.7463333, <https://hdl.handle.net/2268/197436>,
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- presented at The 13th International Symposium on Plasticity & Its Current Applications (Plasticity07), Girwood, United States. <https://hdl.handle.net/2268/444>
25. Noels, L., & Radovitzky, R. (2006). *A new discontinuous Galerkin method for non-linear Mechanics*. Paper presented at 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Newport, United States. doi:10.2514/6.2006-2122 <https://hdl.handle.net/2268/438>
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VOLUMES

1. Hogge, M., Van Keer, R., Dick, E., Malengier, B., Slodicka, M., Béchet, E., Geuzaine, C., Noels, L., & Remacle, J.-F. (Eds.). (2011). *Proceedings of the 5th International Conference on Advanced Computational Methods in Engineering (ACOMEN2011)*. (Dépôt légal: D/2011/0480/31). Liège, Belgium: ULg - Université de Liège, <https://hdl.handle.net/2268/106357>
2. Hogge, M., Van Keer, R., Noels, L., Stainier, L., Ponthot, J.-P., Remacle, J.-F., & Dick, E. (Eds.). (2008). *Actes du Congrès ACOMEN 2008, Second international Conference on Advanced Computational Methods in Engineering, Liège, Belgium, May 26-38, 2008*, <https://hdl.handle.net/2268/26455>

.BOOK-CHAPTERS

1. Hoang Truong, V., Wu, L., Paquay, S., Golinval, J.-C., Arnst, M., & Noels, L. (2017). A Stochastic Multi-scale Model For Predicting MEMS Stiction Failure. In L. V. Starman, J. Hay, & N. Karanjgaokar (Eds.), *Micro and Nanomechanics, Volume 5: Proceedings of the 2016 Annual Conference on Experimental and Applied Mechanics* (Springer International Publishing, pp. 1-8). New York, United States: The Society for Experimental Mechanics, Inc. doi:10.1007/978-3-319-42228-2_1 <https://hdl.handle.net/2268/200451>
2. Noels, L., Wu, L., Adam, L., Seyfarth, J., Soni, G., Segurado, J., Laschet, G., Chen, G., Lesueur, M., Lobos, M., Böhlke, T., Reiter, T., Oberpeilsteiner, S., Sallaberger, D., Weichert, D., & Broekmann, C. (2016). Chapter 6: Effective Properties. In P. Ulrich & G. J. Schmitz (Eds.), *Handbook of Software Solutions for ICME* (pp. 433-441). Weinheim, Germany: Wiley-VCH. doi:10.1002/9783527693566, <https://hdl.handle.net/2268/192084>
3. Wu, L., Golinval, J.-C., & Noels, L. (2013). Stiction Failure in Microswitches Due to Elasto-Plastic Adhesive Contacts. In G. Shaw, B. Prorok, & L. Starman (Eds.), *MEMS and Nanotechnology, Volume 6* (pp. 67-74). Springer. doi:10.1007/978-1-4614-4436-7_11, <https://hdl.handle.net/2268/128286>
4. Wu, L., Noels, L., Adam, L., & Doghri, I. (2013). Non-local Damage-Enhanced MFH for Multiscale Simulations of Composites. In E. Patterson, D. Backman, & G. Cloud (Eds.), *Composite Materials and Joining Technologies for Composites, Volume 7* (pp. 115-121). Springer. doi:10.1007/978-1-4614-4553-1_13, <https://hdl.handle.net/2268/128285>
5. Wu, L., Noels, L., Rochus, V., Pustan, M., & Golinval, J.-C. (2011). Design of Microswitch Systems Avoiding Stiction due to Surface Contact. In T. Proulx (Ed.), *MEMS and Nanotechnology, Volume 2* (pp. 189-195). New York, United States - New York: Springer. doi:10.1007/978-1-4419-8825-6_27, <https://hdl.handle.net/2268/91043>
6. Noels, L., Stainier, L., Ponthot, J.-P., & Bonini, J. (2003). A new formulation of internal forces for non-linear hypoelastic constitutive models verifying conservation laws. In K. J. Bathe (Ed.), *Computational Fluid and Solid Mechanics 2003* (pp. 527-531). Elsevier. doi:10.1016/B978-008044046-0.50130-5, <https://hdl.handle.net/2268/1165>

LIST OF CONFERENCES
NOELS Ludovic
2023

January 2023: International Conference on Plasticity, Damage, and Fracture 2023 (ICPDF 2023) “Redefinition of the interactions in Deep-Material-Networks” Punta Cana, Dominican Republic (Keynote).

April 2022: 18th European Mechanics of Materials Conference (EMMC18), Oxford, United Kingdom. “Elasto-plastic multi-scale simulations accelerated by a recurrent neural network-based surrogate model” Oxford, United Kingdom.

September 2021: COMPLAS 2021, “A Non-Local Ductile Failure Model Accounting for Void Growth and Coalescence at Low and High Stress Triaxiality”, Barcelona, Spain

December 2019 : Asian Pacific Congress on Computational Mechanics (APCOM2019), Taipei, Taiwan, Speaker of “A multi-mechanism non-local porosity model for high-ductile materials; application to high entropy alloys” and co-author of “A probabilistic Mean-Field-Homogenization approach applied to study unidirectional composite structures”

October 2019, ECCOMAS Thematic Conference on: “Computational Modelling of Complex Materials Across the Scales (CMCS 2019)”, Glasgow, UK, “An inverse Mean-Field-Homogenization-based micro-mechanical model for stochastic multiscale simulations of unidirectional composites”, (“distinguished lecture” sur invitation).

March 2019: Euromech Colloquium 600 “New Challenges in Finite Element Technology – from the perspective of mechanics and mathematics”, Aachen, Allemagne, orateur de “Damage to crack transition for ductile materials using a Cohesive-Band/Discontinuous Galerkin framework” (Invited Lecture)

July 2018: 13th World Congress on Computational Mechanics / 2nd Pan American Congress on Computational Mechanics, New York City, USA, Speaker of “A Damage to Crack Transition Framework for Ductile Materials Accounting for Stress Triaxiality” (Keynote) and co-author of “A probabilistic Mean-Field-Homogenization approach applied to study unidirectional composite structures”

November 2017: ECCOMAS Thematic Conference on Computational modeling of Complex Materials across the Scales (CMCS2017), Paris, France, Speaker of “A stochastic 3-scale method to predict the thermo-elastic behaviors of polycrystalline structures”, and co-author of “Generation of unidirectional composite stochastic volume elements from micro-structural statistical information” and of “Computational modeling and analysis of complex cellular material RVEs”

June 2017: 2017 Engineering Mechanics Institute Conference (EMI 2017), San Diego, USA, Speaker of “Stochastic multiscale method applied to thermo-elasticity of polycrystalline micro-structures” and co-author of “Incremental-secant mean-field-homogenization method for elasto-visco-plastic materials systems”

September 2016: 5th edition of the European Mechanics of Materials Conference (EMMC15), Bruxelles, Belgique, “Probabilistic prediction of the quality factor of micro-resonator using a

stochastic thermo-mechanical multi-scale approach”, “Simulations of composite laminates inter and intra-laminar failure using on a non-local mean-field damage-enhanced multi-scale method”, “Unified treatment of microscopic boundary conditions in computational homogenization method for multiphysics problems; Application to thermo-mechanics”, and “A coupled electro-thermo-mechanical discontinuous Galerkin method applied on composite materials”

July 2016: 2nd International Conference on Mechanics of Composites (MechComp2016), Porto, Portugal, “Failure multiscale simulations of composite laminates based on a non-local mean-field damage-enhanced homogenization” and “Mean-Field-Homogenization-based stochastic multiscale methods for composite materials”

June 2016: VII European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS Congress 2016), Crete Island, Greece, “Multi-scale stochastic study of the grain orientation and roughness effects on polycrystalline thin structures”, “Cohesive band model: a triaxiality-dependent cohesive model for damage to crack transition in a non-local implicit discontinuous Galerkin framework”, “Numerical Properties of a Discontinuous Galerkin formulation for electro-thermal coupled problems”, and “Prediction of intra- and inter-laminar failure of laminates using non-local damage-enhanced mean-field homogenization simulations”

July 2015: 9th European Solid Mechanics Conference, ESMC15, Madrid, Spain, "A Non-Local Damage-Enhanced Incremental-Secant Mean-Field-Homogenization For Composite Laminate Failure Predictions" (Keynote) and "A probabilistic multi-scale model for polycrystalline MEMS resonators"

February 2015: Euromech Colloquium 559, Multi-scale computational methods for bridging scales in materials and structures, Eindhoven, The Netherlands, 2015, "Propagation of uncertainties using probabilistic multi-scale models" (on invitation)

August 2014: EMMC 14 European Mechanics of Materials Conference 2014, Gothenburg, Sweden "Computational homogenization of cellular materials with propagation of instabilities through the scales" and "Prediction of meso-scale mechanical properties of poly-silicon materials"

June 2014: IAS 2014 Instabilities Across the Scales (IAS) Symposium, Cachan, France (on invitation) "Multi-scale methods with strain-softening: damage-enhanced MFH for composite materials and computational homogenization for cellular materials with micro-buckling" (on invitation)

December 2013: 5th Asia Pacific Congress on Computational Mechanics & 4th International Symposium on Computational Mechanics APCOM & ISCM 2013, Singapore, Singapore. “Probabilistic model for MEMS micro-beam resonance frequency made of polycrystalline linear anisotropic material”, "A micro-meso model to predict van der Waals and capillary induced stiction in micro-structures", and "Non-Local Incremental-Secant Mean-Field-Homogenization of Damage-Enhanced Elasto-Plastic Composites"

June 2013: 17th International Conference on Composite Structures (ICCS/17), Porto, Portugal. “Non-local multiscale analyzes of composite laminates based on a damage-enhanced mean-

field homogenization formulation” and “An incremental-secant mean-field homogenization scheme for elasto-plastic and damage-enhanced elasto-plastic composite materials”

June 2013: 3rd International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC2013), Prague, Czech Republic. “A micro-model of the intralaminar fracture in fiber-reinforced composites based on a discontinuous Galerkin/extrinsic cohesive law method” and “Modeling of damage to crack transition using a coupled discontinuous Galerkin/cohesive extrinsic law framework”

July 2012: 8th European Solid Mechanics Conference (ESMC2012), Graz, Austria. “A one-field formulation of elasto-plastic shells with fracture applications” and “Multiscale Simulations of Composites with Non-Local Damage-Enhanced Mean-Field Homogenization.”

June 2012: XII International Congress & Exposition on Experimental & Applied Mechanics (SEM XII), Costa Mesa, CA, USA. “Stiction failure in microswitches due to elasto-plastic adhesive contact” and “Non-local damage-enhanced MFH for multiscale simulations of composites”

November 2011: Advanced COmputational Methods in ENgineering (ACOMEN 2011), Liège, Belgium. “Influence of the elasto-plastic adhesive contact on Micro-Switches”, “Vectorial Incremental Nonconservative Consistent Hysteresis model”, “Imposing periodic boundary condition on arbitrary meshes by polynomial interpolation”, “Full discontinuous Galerkin formulation of shell in large deformations with fracture mechanic applications”, “A two-scale model predicting the mechanical sliding and opening behavior of grain boundaries in nanocrystalline solids”, and “Homogenization of fibre reinforced composite with gradient enhanced damage model”

June 2011: International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2011), Barcelona, Spain. “A shell fracture framework based on a full discontinuous Galerkin formulation combined with an extrinsic cohesive law” and “Multi-scale modelling of fibre enforced composite with non-local damage variable”

April 2010: 11th Thermal, Mechanical and Multiphysics Simulation and Experiments in Micro/Nanoelectronics and Systems (EuroSimE2010), Bordeaux, France. “Prediction of Stiction in Microswitch Systems.”

April 2009: 12th International ESAFORM Conference on Material Forming (ESAFORM 2009), University of Twente, Enschede, The Netherlands. “A one-field discontinuous Galerkin formulation of non-linear Kirchhoff-Love shells”

July 2008: 8th World Congress on Computational Mechanics (WCCM8) and the 5th. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008), Venice, Italy. “A discontinuous Galerkin Formulation of Kirchhoff-Love shells: from linear elasticity to finite deformations”

July 2007: 9th US National Congress on Computational Mechanics, USACM, San Francisco, USA. “A Discontinuous Galerkin Method for Linear Strain- Gradient Theory of Elasticity in Three Dimensions” and “A New Discontinuous Galerkin Formulation of Kirchhoff-Love Shells”

June 2007: ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (CompDyn 2007), Rethymno, Crete, Greece. “A New Energy-Dissipative Momentum-Conserving Time Integration Scheme Using the Variational Updates Framework”

June 2007: 13th International Symposium on Plasticity & its Current Applications (Plasticity07), Girdwood, Alaska, USA. “Introduction of Numerical Dissipation in the Variational Updates Framework for Elasto-Plastic Constitutive Models”

July 2006: 7th World Congress on Computational Mechanics, Los-Angeles, CA, USA. “An energy momentum conserving algorithm using the incremental potential for visco plasticity”, “A New discontinuous Galerkin formulation for non-linear elasticity” and “Numerical simulation of blast-structure interaction”

May 2006: 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Newport, RI, USA. “A new discontinuous Galerkin method for non-linear”

July 2004: 5th International Symposium on Impact Engineering, Cambridge, UK. “Simulation of complex impact problems with implicit time algorithms: Application to a turbo-engine blade loss problem”

June 2003: Second MIT Conference on computational Fluid and Solid, Cambridge, MA, USA. “A new formulation of internal forces for non-linear hypoelastic constitutive models verifying conservation laws”

May 2003: 6^{ème} Colloque National en Calcul des Structures, Giens, France. “A new formulation of internal forces for non-linear hypoelastic constitutive models verifying conservation laws”

May 2002: Structures Under Shock and Impact 2002, Montréal, Canada. “Implicit-explicit time integration algorithms for the numerical simulation of blade-casing interactions”