

# CURRICULUM VITÆ

## NOELS Ludovic

### PERSONAL DETAILS

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Office address Université de Liège, LTAS-CM3  
Allée de la découverte 9, B4000 Liège 1, Belgium, +32 (0)4 366 48 26  
E-mail [l.noels@uliege.be](mailto:l.noels@uliege.be)  
Date of birth February 10, 1977  
Nationality Belgian

### EDUCATION & QUALIFICATION

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- 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

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Since January 2015:

- 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)

### INTERNATIONAL EXPERIENCES

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Postdoctoral extended stay

- January 2005-August 2006, Massachusetts Institute of Technology (MIT), USA
- Unit of Prof. Raul Radovitzky

Invited Lecturer at Northwestern Polytechnical University, Xi’an, China

- April 2014
- Taught the class on “Aircraft structure fatigue”

Participations to/initiation of international research projects

- Three ERA-NET (FP7) projects: SIMUCOMP, 3SMVIB, STOMMMAC
- Collaborations with other Universities through PhD theses

Organization of the Erasmus Mundus Master program THRUST (turbomachinery)

- In collaboration with KTH (Sweden, Coordinator), Duke (USA) & AUTH (Greece)

Main organizer of international conferences

- May 2008, 4th Int. conf. on Advanced COmputational Methods in ENgineering (ACOMEN08)
- November 2011, 5th Int. conf. on Advanced COmputational Methods in ENgineering (ACOMEN11)

Participation to several conferences (>15)

## RESPONSIBLE FOR CLASSES

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- 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

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- Hussein Rappel, in co-supervision with Stéphane Bordas, University of Luxembourg “Model and parameter identification through Bayesian inference in solid mechanics”, September 2018, L. Noels co-supervisor, S.P.A. Bordas, Supervisor (University of Luxembourg).
- Vinh Hoang Truong, “Stochastic multi-scale modeling MEMS stiction”, September 2017.
- Lina Homsy, “Development of non-linear electro-thermo-mechanical discontinuous Galerkin formulations”, May 2017.
- Vincent Lucas, “Stochastic multi-scale modeling of vibrating MEMS”, August 2016.
- Vincent Péron-Lührs, “Development and numerical validation of a 2-scale computational model to study the mechanical behavior of nanocrystalline metals”, May 2014.
- Van-Dung Nguyen, “Computational homogenization of cellular materials capturing micro-buckling, macro-localization and size effects”, March 2014.
- Gauthier Becker, “Numerical simulations of brittle and elasto-plastic fracture for thin structures subjected to dynamic loadings”, Mai 2012.
- Julien Leclerc, “Damage to crack initiation and propagation models for ductile materials”, graduation scheduled for 2019.
- Nanda Gopala Kilingar, in co-supervision with Thierry Massart, Université Libre de Bruxelles, “Upscaling of open foams behaviour with variability”, graduation scheduled for 2020.
- Soumianarayanan Vijayaraghavan, in co-supervision with Stéphane Bordas, University of Luxembourg “Stochastic modelling of lattice structures for additive layer manufacturing”, graduation scheduled for 2021
- Miguel Pareja Munoz, “Multiscale methods for smart composite materials”, graduation scheduled for 2021.
- Philippe Harik, “Fracture modelling of high-entropy alloys”, graduation scheduled for 2021.
- Juan Manuel Calleja, “Micro-mechanics based reduced order models for woven composites”, graduation scheduled for 2022.
- Tymofii Khvan, “Nano-indentation for sub-miniaturized testing of irradiated materials: FEM analysis and experiments”, graduation scheduled for 2022.

## GRANTS

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- 2018-2022, ULg 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)
- 2018-2021, ULg administrator of “Virtual Impact Sizing COMposites Structures - VISCOS” project, 21st call of SkyWin Walloon Centre, 3 322 000 €, SONACA, Isomatex, e-Xstream, UcL, ULiege
- 2017-2021: 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 (ULg), EEI (ULg), CERM (ULg)
- 2017-2021, ULg 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, ULg
- 2016-2020, ULg 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€, ULg, ULB, Luxembourg National Fund for research, 250 000€, University of Luxembourg
- 2016-2019, ULg administrator of “MRIPF - Fracture Model for Impact, Penetration, and/or Fragmentation”, project 7581 of the MecaTech 16<sup>th</sup> call, 1 927 180 €, GDTech, Les Forges de Zeebrugge, Mecar S.A., l'Université catholique de Louvain, UCL/iMMC/IMAP, Carat Duchatelet (Belgique)
- 2015-2018, ULg 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€, Belgium, Luxembourg, Austria, Spain
- 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€, ULg, UCL
- 2014-2017, supervisor of the FNRS-FRIA PhD Grant “Stochastic multi-scale modeling MEMS stiction”, V. Hoang Truong, ULg
- 2012-2015, ULg administrator of “3SMVIB - 3-Scale modelling for robust-design of vibrating micro sensors” project, MNT.ERA-NET (FP7) program, 1 497 000€, Belgium, Romania, Poland
- 2011-2013, coordinator of “Modelling of damage to crack transition using a coupled discontinuous Galerkin/Cohesive zone method” (FSRD-11/01, 91 050€), ULg
- 2011-2014, coordinator of “Robust Multi-Scale Design of MEMS“, FRFC 2.4508.11, Belgian National Fund for research, 136 355€, ULg, UCL
- 2010-2013, ULg administrator of “SIMUCOMP- Advanced Numerical Simulations of Inter- and Intralaminar Failures in Composites“ project, ERA-NET MATERA+ (FP7) program, 1 543 586€, Spain, Belgium, Luxemburg
- 2009-2014, participant to “From Imaging to geometrical modelling of complex microstructured materials” (ARC 09/14-02), French Community of Belgium, 1 091 656€, ULg
- 2009-2014, ULg administrator of the Master Erasmus Mundus “THRUST”, KTH, AUTH, ULg, DUKE

- 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, ULg

## INVITED LECTURES

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- 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
- 17-19 May 2018, 16th Youth Symposium on Experimental Solid Mechanics (YSESM18), Traunkirchen Monastery, Austria, “Computational Fracture Mechanics” (plenary lecture)
- June 2016, “A stochastic 3-Scale approach to study the thermo-mechanical damping of MEMS”, Université du Luxembourg, Luxembourg
- 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
- 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
- April 2014, “Instabilities through the length-scales”, Oxford Solid Mechanics, Oxford, United Kingdom
- 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
- January 2014, “Homogenization with propagation of instabilities through the different scales”, UniGR-intermatGR-Workshop on Multiscale simulations
- March 2013, “Homogenization strategies for non-linear engineered materials”, Oxford Solid Mechanics, Oxford, United Kingdom
- 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

## AWARDS

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- Award «des amis de l'Université de Liège (Prix Président André Leroux)» (Belgium, 2007)
- Best paper award at the 25<sup>th</sup> 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)
- AILg award for the best thesis (Belgium, 2000)

## SKILLS

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- Development of open-source Finite-elements platform
- Non-linear structures (large displacements, plasticity, contact)
- Time integration algorithm (energy-momentum algorithms)
- Multi-Scale Methods

## LANGUAGES

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French	Mother tongue
English	Fluent
Dutch	Elementary level

## COMMUNITY DUTIES

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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 (1 paper)
- Advanced Modeling and Simulation in Engineering Sciences (1 paper)
- Advances in Engineering Software (1 paper)
- AIAA Journal (1 paper)
- ASME Journal of Vibration and Acoustics (1 paper)
- ASME Journal of Applied Mechanics (3 papers)
- Composite Structures (7 papers)
- Composites Part B (1 paper)
- Computational Materials Science (3 papers)
- Computer Method in Applied Mechanics and Engineering (12 papers)
- Computers & Structures (3 papers)
- Continuum Mechanics and Thermodynamics, (2 papers)
- European Journal of Mechanics - A/Solids (4 papers)
- Experimental Mechanics (1 paper)
- Finite Elements in Analysis and Design (4 papers)
- International Journal for Numerical Methods in Engineering (13 papers)
- International Journal of Computational Methods (3 papers)
- International Journal of Solids and Structures (2 papers)
- Inverse Problems in Science & Engineering (1 paper)
- Journal of Computational and Applied Mathematics (3 papers)
- Journal of Electromagnetic Waves and Applications (1 paper)
- Journal of Mechanical Science and Technology (1 paper)
- Journal of Micromechanics and Microengineering (2 papers)

- Journal of Multiscale Modelling (1 paper)
- Journal of the Mechanics and Physics of Solids (1 paper)
- Mathematics and Computers in Simulation (1 paper)
- Mechanics of Materials (3 papers)
- Micromachines, I.F. 1.295 (1 paper)
- Nanotechnology (1 paper)
- Proceedings A of Royal Society (1 paper)
- Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture (4 papers)
- Scientific Reports -Nature (1 paper)
- Theoretical and Applied Fracture Mechanics (1 paper)
- Tribology international (3 papers)
- Zeitschrift für Angewandte Mathematik und Mechanik (1 paper)

#### 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)
- 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)
- Poland National Science Centre

#### PUBLICATIONS IN INTERNATIONAL JOURNALS

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Author of more than 50 publications in international peer-reviewed journals and of several papers in conference-proceedings: see attached list.

LIST OF PUBLICATIONS  
NOELS Ludovic  
2018

PhD THESIS

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**Contributions to energy-conserving time integration algorithms for non-linear dynamics** (in French). *University of Liège* (2004)

PhD THESES AS SUPERVISOR

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**Model and parameter identification through Bayesian inference in solid mechanics**, Hussein Rappel, *University of Luxembourg, University of Liège* (2018)

**Stochastic multiscale modelling of MEMS stiction failure**. V. Hoang Truong, *University of Liège* (2017)

**Development of non-linear Electro-Thermo-Mechanical Discontinuous Galerkin formulations**. L. Homsí, *University of Liège* (2017)

**Stochastic multi-scale modelling of MEMS**. V. Lucas, *University of Liège* (2016)

**Development and numerical validation of a 2-scale computational model to study the mechanical behavior of nanocrystalline metals**. V. Péron, *University of Liège* (2014)

**Computational homogenization of cellular materials capturing micro-buckling, macro-localization and size effects**. V.-D. Nguyen, *University of Liège* (2014)

**Numerical simulations of brittle and elasto-plastic fracture for thin structures subjected to dynamic loadings**. G. Becker, *University of Liège* (2012)

PUBLICATIONS IN PEER-REVIEWED INTERNATIONAL JOURNALS

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**3D finite element formulation for mechanical-electrophysiological coupling in axonopathy**. M. T. Kwong, F. Bianchi, M. Malboubi, J. A. García-Grajales, L. Homsí, M. Thompson, H. Ye, L. Noels, and A. Jérusalem. *Computer Methods in Applied Mechanics and Engineering* (in press).

**Identifying elastoplastic parameters with Bayes' theorem considering double error sources and model uncertainty**. H. Rappel, L. A. A. Beex, L. Noels, and S. Bordas. *Probabilistic Engineering Mechanics* (in press).

**A micro-mechanics-based inverse study for stochastic order reduction of elastic UD-fiber reinforced composites analyzes**. L. Wu, L. Adam, and L. Noels. *International Journal for Numerical Methods in Engineering* 115(12), 2018, 1430-1456 (doi: [10.1002/nme.5903](https://doi.org/10.1002/nme.5903)).

**From SEM images to elastic responses: a stochastic multiscale analysis of UD fiber reinforced composites.** L. Wu, C. N. Chung, Z. Major, L. Adam, and L. Noels. *Composite Structures* 189C, 2018, 206-227 (doi: [10.1016/j.compstruct.2018.01.051](https://doi.org/10.1016/j.compstruct.2018.01.051)).

**Stochastic multiscale model of MEMS stiction accounting for high order statistical moments of non-Gaussian contacting surfaces.** V. Hoang Truong, L. Wu, J.-C. Golinval, M. Arnst, and L. Noels. *IEEE/ASME Journal of Microelectromechanical Systems* 27(2), 2018, 137-155 (doi: [10.1109/JMEMS.2018.2797133](https://doi.org/10.1109/JMEMS.2018.2797133)).

**A discontinuous Galerkin method for non-linear electro-thermo-mechanical problems; Application to shape memory composite materials.** L. Homsy and L. Noels. *Meccanica* 53, no. 6 (April 2018): 1357-1401 (doi: [10.1007/s11012-017-0743-9](https://doi.org/10.1007/s11012-017-0743-9)).

**From SEM images to elastic responses: a stochastic multiscale analysis of UD fiber reinforced composites.** L. Wu, C. N. Chung, Z. Major, L. Adam, and L. Noels. *Composite Structures*: 189C, 2018, 206-227 (doi: [10.1016/j.compstruct.2018.01.051](https://doi.org/10.1016/j.compstruct.2018.01.051)).

**A damage to crack transition model accounting for stress triaxiality formulated in a hybrid non-local implicit discontinuous Galerkin - cohesive band model framework.** J. Leclerc, L. Wu, V. D. Nguyen, and L. Noels. *International Journal for Numerical Methods in Engineering*: 113, no. 3, 2018, 374-410 (doi: [10.1002/nme.5618](https://doi.org/10.1002/nme.5618)).

**A coupled electro-thermal Discontinuous Galerkin method.** L. Homsy, C. Geuzaine, and L. Noels. *Journal of Computational Physics*: 348, 2017, 231-258 (doi: [10.1016/j.jcp.2017.07.028](https://doi.org/10.1016/j.jcp.2017.07.028)).

**An incremental-secant mean-field homogenization method with second statistical moments for elasto-visco-plastic composite materials.** L. Wu, L. Adam, I. Doghri, and L. Noels. *Mechanics of Materials*: 114, 2017, 180-200 (doi: [10.1016/j.mechmat.2017.08.006](https://doi.org/10.1016/j.mechmat.2017.08.006)).

**Propagation of material and surface profile uncertainties on MEMS micro-resonators using a stochastic second-order computational multi-scale approach.** V. Lucas, J.-C. Golinval, R. Voicu, M. Danila, R. Gravila, R. Muller, A. Dinescu, L. Noels, and L. Wu. *International Journal for Numerical Methods in Engineering*: 111(1), 2017, 26-68 (doi: [10.1002/nme.5452](https://doi.org/10.1002/nme.5452)).

**A computational stochastic multiscale methodology for MEMS structures involving adhesive contact.** V. Hoang Truong, L. Wu, S. Paquay, J.-C. Golinval, M. Arnst, and L. Noels. *Tribology International*: 110, 2017, 401-425 (doi: [10.1016/j.triboint.2016.10.007](https://doi.org/10.1016/j.triboint.2016.10.007)).

**Unified treatment of boundary conditions and efficient algorithms for estimating tangent operators of the homogenized behavior in the computational homogenization method.** V. D. Nguyen, L. Wu, and L. Noels. *Computational Mechanics*: 59(3), 2017, 483-505 (doi: [10.1007/s00466-016-1358-z](https://doi.org/10.1007/s00466-016-1358-z)).

**A Stochastic Multi-Scale Approach for the Modeling of Thermo-Elastic Damping in Micro-Resonators.** L. Wu, V. Lucas, V. D. Nguyen, J.-C. Golinval, S. Paquay, and L. Noels. *Computer Methods in Applied Mechanics & Engineering*: 310, 2016, 802-839 (doi: [10.1016/j.cma.2016.07.042](https://doi.org/10.1016/j.cma.2016.07.042)).



**A large strain hyperelastic viscoelastic-viscoplastic-damage constitutive model based on a multi-mechanism non-local damage continuum for amorphous glassy polymers.** V. D. Nguyen, F. Lani, T. Pardoën, X. Morelle, and L. Noels. *International Journal of Solids and Structures*: 96, 2016, 192-216 ([doi: 10.1016/j.ijsolstr.2016.06.008](https://doi.org/10.1016/j.ijsolstr.2016.06.008)).

**A probabilistic model for predicting the uncertainties of the humid stiction phenomenon on hard materials.** V. Hoang Truong, L. Wu, S. Paquay, A. C. Obreja, R. Voicu, R. Müller, J.-C. Golinval, and L. Noels. *Journal of Computational & Applied Mathematics*: 289, 2015, 173-195 ([doi: 10.1016/j.cam.2015.02.022](https://doi.org/10.1016/j.cam.2015.02.022)).

**Experimental and computational micro-mechanical investigations of compressive properties of polypropylene/multi-walled carbon nanotubes nanocomposite foams.** F. Wan, M.-P. Tran, C. Leblanc, E. Béchet, E. Plougonven, A. Léonard, C. Detrembleur, L. Noels, J.-M. Thomassin, V.-D. and Nguyen. *Mechanics of Materials*: 91(Part 1), 2015, 95-118 ([doi : 10.1016/j.mechmat.2015.07.004](https://doi.org/10.1016/j.mechmat.2015.07.004)).

**A stochastic computational multiscale approach; Application to MEMS resonators.** V. Lucas, J.-C. Golinval, S. Paquay, V. D. Nguyen, L. Noels, and L. Wu. *Computer Methods in Applied Mechanics & Engineering*: 294, 2015, 141-167 ([doi: 10.1016/j.cma.2015.05.019](https://doi.org/10.1016/j.cma.2015.05.019)).

**A study of composite laminates failure using an anisotropic gradient-enhanced damage mean-field homogenization model.** L. Wu, F. Sket, J. M. Molina-Aldareguia, A. Makradi, L. Adam, I. Doghri, and L. Noels. *Composite Structures*: 126, 2015, 246-264 ([doi: 10.1016/j.compstruct.2015.02.070](https://doi.org/10.1016/j.compstruct.2015.02.070)).

**An XFEM/CZM implementation for massively parallel simulations of composites fracture.** G. Viguera, F. Sket, C. Samaniego, L. Wu, L. Noels, D. Tjahjanto, E. Casoni, G. Houzeaux, A. Makradi, J.M. Molina-Aldareguia, M. Vazquez, and A. Jérusalem. *Composite Structures*: 125, 2015, 542-557 ([doi: 10.1016/j.compstruct.2015.01.053](https://doi.org/10.1016/j.compstruct.2015.01.053)).

**Multiscale modelling framework for the fracture of thin brittle polycrystalline films - Application to polysilicon.** S. Mulay, G. Becker, R. Vayrette, J.-P. Raskin, T. Pardoën, M. Galceran, S. Godet, and L. Noels. *Computational Mechanics*: 55(1), 2015, 73-91 ([doi: 10.1007/s00466-014-1083-4](https://doi.org/10.1007/s00466-014-1083-4)).

**An incremental-secant mean-field homogenisation method with second statistical moments for elasto-plastic composite materials.** L. Wu, I. Doghri, and L. Noels. *Philosophical Magazine*: 95(28-30), 2015, 3348-3384 ([doi : 10.1080/14786435.2015.1087653](https://doi.org/10.1080/14786435.2015.1087653)).

**Elastic damage to crack transition in a coupled non-local implicit discontinuous Galerkin/extrinsic cohesive law framework.** L. Wu, G. Becker, and L. Noels. *Computer Methods in Applied Mechanics & Engineering*: 279, 2014, 379-409 ([10.1016/j.cma.2014.06.031](https://doi.org/10.1016/j.cma.2014.06.031)).

**Multiscale Computational Modeling of Deformation Mechanics and Intergranular Fracture in Nanocrystalline Copper.** V. Péron-Lührs, F. Sansoz, A. Jérusalem and L. Noels. *Computational Materials Science*: 90, 2014, 253-264 ([10.1016/j.commatsci.2014.03.070](https://doi.org/10.1016/j.commatsci.2014.03.070)).

**Computational homogenization of cellular materials.** V.-D. Nguyen and L. Noels. *International Journal of Solids and Structures*: 51(11-12), 2014, 2183-2203 ([10.1016/j.ijsolstr.2014.02.029](https://doi.org/10.1016/j.ijsolstr.2014.02.029)).

**Quasicontinuum study of the shear behavior of defective tilt grain boundaries in Cu.** V. Péron-Lühns, F. Sansoz and L. Noels. *Acta Materialia*: 64, 2014, 419-428 ([10.1016/j.actamat.2013.10.056](https://doi.org/10.1016/j.actamat.2013.10.056)).

**A combined incremental-secant mean-field homogenization scheme with per-phase residual strains for elasto-plastic composites.** L. Wu, L. Noels, A. Adam, and I. Doghri. *International Journal of Plasticity*: 51, 2013, 80-102 ([doi:10.1016/j.ijplas.2013.06.006](https://doi.org/10.1016/j.ijplas.2013.06.006)).

**An implicit-gradient-enhanced incremental-secant mean-field homogenization scheme for elasto-plastic composites with damage.** L. Wu, L. Noels, A. Adam, and I. Doghri. *International Journal of Solids and Structures*: 50(24), 2013, 3843-3860 ([doi:10.1016/j.ijsolstr.2013.07.022](https://doi.org/10.1016/j.ijsolstr.2013.07.022)).

**A two-scale model predicting the mechanical behavior of nanocrystalline solids.** V. Péron-Lühns, A. Jérusalem, F. Sansoz, L. Stainier, and L. Noels. *Journal of the Mechanics & Physics of Solids*: 61(9), 2013, 1895-1914 ([doi: 10.1016/j.jmps.2013.04.009](https://doi.org/10.1016/j.jmps.2013.04.009)).

**An Energy-Based Variational Model of Ferromagnetic Hysteresis for Finite Element Computations.** V. François-Lavet, F. Henrotte, L. Stainier, L. Noels, C. Geuzaine. *Journal of Computational & Applied Mathematics*: 246, 2013, 243-250 ([doi: 10.1016/j.cam.2012.06.007](https://doi.org/10.1016/j.cam.2012.06.007)).

**Multiscale computational homogenization methods with a gradient enhanced scheme based on the discontinuous Galerkin formulation.** V. D. Nguyen, G. Becker, and L. Noels. *Computer Methods in Applied Mechanics & Engineering* (in press) ([doi: 10.1016/j.cma.2013.03.024](https://doi.org/10.1016/j.cma.2013.03.024)).

**A micro-meso-model of intra-laminar fracture in fiber-reinforced composites based on a Discontinuous Galerkin/Cohesive Zone Method.** L. Wu, D. Tjahjanto, G. Becker, A. Makradi, A. Jérusalem, and L. Noels. *Engineering Fracture Mechanics*: 104, 2013, 162-183 ([doi: 10.1016/j.engfracmech.2013.03.018](https://doi.org/10.1016/j.engfracmech.2013.03.018)).

**A full-discontinuous Galerkin formulation of non-linear Kirchhoff-Love shells: elasto-plastic finite deformations, parallel computation & fracture applications.** G. Becker, L. Noels. *International Journal for Numerical Methods in Engineering*: 93(1), 2013, 80-117 ([doi:10.1002/nme.4381](https://doi.org/10.1002/nme.4381)).

**A Micro Model for Elasto-Plastic Adhesive-Contact in Micro-Switches: Application to cyclic loading.** L. Wu, J.-C. Golinval, L. Noels. *Tribology International*: 57, 2013, 137-146 ([doi:10.1016/j.triboint.2012.08.003](https://doi.org/10.1016/j.triboint.2012.08.003)).

**Validation tests of the full-discontinuous Galerkin / extrinsic cohesive law framework of Kirchhoff-Love shells.** G. Becker, L. Noels. *International Journal of Fracture*: 178(1), 2012, 299-322 ([doi:10.1007/s10704-012-9748-5](https://doi.org/10.1007/s10704-012-9748-5)).

**Imposing periodic boundary condition on arbitrary meshes by polynomial interpolation.** V. D. Nguyen, E. Béchet, C. Geuzaine, L. Noels. *Computational Materials Science*: 55, 2012, 390-406 ([doi: 10.1016/j.commatsci.2011.10.017](https://doi.org/10.1016/j.commatsci.2011.10.017)).

**Serial FEM/XFEM-Based Update of Preoperative Brain Images Using Intraoperative MRI.** L. Vigneron, L. Noels, S. Warfield, J. Verly, P. Robe. *International Journal of Biomedical Imaging*: 2012, 2012, ID 872783, 17 pages ([doi:10.1155/2012/872783](https://doi.org/10.1155/2012/872783)).

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## BOOK-CHAPTERS

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**A Stochastic Multi-scale Model For Predicting MEMS Stiction Failure.** V. Hoang Truong, L. Wu, S. Paquay, J.-C. Golinval, M. Arnst, and L. Noels. *In L. Starman et al. (eds.), Micro and Nanomechanics. Micro and Nanomechanics, Conference Proceedings of the*

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LIST OF CONFERENCES  
NOELS Ludovic  
2018

July 2018: 13th World Congress on Computational Mechanics / 2nd Pan American Congress on Computational Mechanics, New York City, USA, orateur de "A Damage to Crack Transition Framework for Ductile Materials Accounting for Stress Triaxiality" (Keynote) et co-auteur de "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, orateur de "A stochastic 3-scale method to predict the thermo-elastic behaviors of polycrystalline structures", et co-auteur de "Generation of unidirectional composite stochastic volume elements from micro-structural statistical information" et de "Computational modeling and analysis of complex cellular material RVEs"

June 2017: 2017 Engineering Mechanics Institute Conference (EMI 2017), San Diego, USA, orateur de "Stochastic multiscale method applied to thermo-elasticity of polycrystalline micro-structures" et co-auteur de "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: 17<sup>th</sup> International Conference on Composite Structures (ICCS/17), Porto, Portugal. "Non-local multiscale analyses 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: 3<sup>rd</sup> International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC2013), Prague, Czech Republic. "A micro-model of the intra-laminar 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: 8<sup>th</sup> 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: 11<sup>th</sup> Thermal, Mechanical and Multiphysics Simulation and Experiments in Micro/Nanoelectronics and Systems (EuroSimE2010), Bordeaux, France. “Prediction of Stiction in Microswitch Systems.”

April 2009: 12<sup>th</sup> 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: 8<sup>th</sup> 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: 9<sup>th</sup> 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: 7<sup>th</sup> 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: 47<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Newport, RI, USA. “A new discontinuous Galerkin method for non-linear”

July 2004: 5<sup>th</sup> 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: 6ème 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”