

PROF. DR.-ING. STÉPHANE P.A. BORDAS

Université du Luxembourg
Campus Belval / Maison du Nombre
6, Avenue de la Fonte
L-4364 Esch-sur-Alzette

Mobile: +(352) 621 131 048
Fax: +(352) 46 66 44 35567
Email: stephane.bordas@uni.lu
Web: <http://legato-team.eu/>

Stéphane P.A. Bordas received his PhD degree from Northwestern University in 2003 in Theoretical and Applied Mechanics. Since November 2013, he is professor of Computational Mechanics at the University of Luxembourg (UL). Named ISI Highly Cited Researcher in Computer Science by Thomson Reuters (2014-2021), he has h-index 60 (Scopus), m-index 4.14, 13,279 citations, and has published over 200 international journal papers. He is Editor in Chief of *Advances in Applied Mechanics* (Elsevier), the number one journal in Computational Mechanics. Prof. Bordas has acquired around 27M€ in funding, since 2006, for his interdisciplinary research on *multiscale methods for fracture, error estimation, model reduction for non-linear problems and medical simulation*. In 2011 he was awarded an ERC Starting Grant for RealTCut - Towards real-time multiscale simulation of cutting in nonlinear materials. With this funding he put together an expert team of promising young researchers (www.legato-team.eu). He has supervised/co-supervised over 30 PhD's & 14 post-docs. Presently, he is supervising 15 PhD's and 8 post-docs, including 3 ESRs in an ITN and 5 Marie Skłodowska Curie Fellows.

Biographical Sketch

- Professor, University of Luxembourg (Nov. 2013 – present)
- Professor, Cardiff University (Sept. 2009 – present)
- Adjunct Professor, University of Western Australia (2015 – 2018)
- Assistant Professor, Glasgow University (July 2006 – Aug. 2009)
- Postdoctoral Researcher, EPFL, Lausanne, Switzerland (Sept. 2003 – July 2006)
- Doctoral Researcher, Northwestern University (Sept. 1998 – Dec. 2003)

Acquired Funding as PI (selected; total over 27 million EUR since 2006)

- Increasing the scientific excellence and innovation capacity in Data-Driven Simulation of the University of Luxembourg, **H2020-WIDENING-TWINNING**; 1,000,000€; 2019-2021
- Rapid Biomechanics Simulation for Personalized Clinical Design, **H2020-MSCA-ITN**; 750,000€ (for ULux); 2018-2022
 - Multiscale modelling of lightweight metallic materials accounting for variability of geometrical and
 - Towards real time multiscale simulation of cutting in non-linear materials with applications to surgical simulation and computer guided surgery; **ERC-StG**; 1,350,000€; 2012-2016

Scientific Awards & Honors

- Thomson Reuters Highly Cited Researcher 2014-2021 Top 150 worldwide in his field
- Elected member of the Young Academy of Europe 2013.
- ERC Starting Grant "Towards real time multiscale simulation of cutting in non-linear materials with applications to surgical simulation and computer guided surgery" 2012-2016.
- Top reviewer for Proc. Roy. Soc. A 2010.
- Royal Academy of Engineering/Leverhulme Senior Research Fellowship 2009.
- Scottish Crucible Fellowship Award for promising young academics 2009.

Selected Recent Publications

Three of these papers are in the top 0.1% most cited, 14 in the top 1%, in their publication year in Engineering (source: ISI). Six of his papers were ranked in the top 500 of one of the 256 scientific categories indexed in Web of Science. Two of these were ranked 126 and 197 (out of 50,580 articles).

From quantum to continuum mechanics in the delamination of atomically-thin layers from substrates

P Hauseux, TT Nguyen, A Ambrosetti, KS Ruiz, SPA Bordas, A. Tkatchenko

Nature Communications 11 (1), 1-8 (OA)

Quantifying discretization errors for soft tissue simulation in computer assisted surgery: A preliminary study, M Duprez, SPA Bordas, M Bucki, HP Bui, F Chouly, V Lleras, C Lobos, ..., Applied Mathematical Modelling 77, 709-723 (not Open Access)

Structural shape optimization of three dimensional acoustic problems with isogeometric boundary element methods, LL Chen, H Lian, Z Liu, HB Chen, E Atroshchenko, SPA Bordas, Computer Methods in Applied Mechanics and Engineering 355, 926-951 (not OA)

An implicit boundary approach for viscous compressible high Reynolds flows using a hybrid remeshed particle hydrodynamics method, A Obeidat, SPA Bordas, Journal of Computational Physics 391, 347-364 (not OA)

A new locking-free polygonal plate element for thin and thick plates based on Reissner-Mindlin plate theory and assumed shear strain fields, J Videla, S Natarajan, SPA Bordas, Computers & Structures 220, 32-42 (not OA)

A gradient weighted extended finite element method (GW-XFEM) for fracture mechanics, SZ Feng, SPA Bordas, X Han, G Wang, ZX Li, Acta Mechanica 230 (7), 2385-2398 (not OA)

A unified polygonal locking-free thin/thick smoothed plate element, I Katili, IJ Maknun, AM Katili, SPA Bordas, S Natarajan, Composite Structures 219, 147-157 (not OA)

Coupled molecular-dynamics and finite-element-method simulations for the kinetics of particles subjected to field-mediated forces, M Cascio, D Baroli, S Bordas, I Deretzis, G Falci, A Magliano, A La Magna, Physical Review E 99 (6), 063307 (not OA)

Weak and strong form meshless methods for linear elastic problem under fretting contact conditions, G Kosec, J Slak, M Depolli, R Trobec, K Pereira, S Tomar, T Jacquemin, ..., Tribology International (not OA)

A unified enrichment approach addressing blending and conditioning issues in enriched finite elements, K Agathos, E Chatzi, SPA Bordas, Computer Methods in Applied Mechanics and Engineering 349, 673-700 (not OA)

Selected Most Relevant Publications

Identifying elastoplastic parameters with Bayes' theorem considering output error, input error and model uncertainty, H Rappel, LAA Beex, L Noels, SPA Bordas, Probabilistic Engineering Mechanics 55, 28-41 (not Open Access)

A Mass Conservative Kalman Filter Algorithm for Computational Thermo-Fluid Dynamics, C Intorini, S Lorenzi, A Cammi, D Baroli, B Peters, S Bordas, Materials 11 (11), 2222 (not OA)

Deep neural network with high-order neuron for the prediction of foamed concrete strength, T Nguyen, A Kashani, T Ngo, S Bordas, Computer-Aided Civil and Infrastructure Engineering 34 (4), 316-332 (not OA)

Real-time error control for surgical simulation, HP Bui, S Tomar, H Courtecuisse, S Cotin, SPA Bordas IEEE Transactions on Biomedical Engineering, 65 (3), 596-607 (not OA)

"What Makes Data Science Different?: a Discussion Involving Statistics2.0 and Computational Sciences. Ley, Christophe, and Stéphane Bordas. 2018." *International Journal of Data Science and Analytics* 6 (3): 167–175 (not OA)

Selected Academic & Professional Services

- Executive Editor, Data-Centric Engineering
- Editor in Chief for Advanced in Applied Mechanics, Editor of 4 other international journals (Elsevier, ...)
- Editorial Board Member for over 6 international journals
- Conference committee for over 50 international conferences
- Chairman of over 6 international conferences and symposia
- Reviewer for a dozen international funding agencies and over 70 international journals (ranked within the top 50 reviewers in Engineering in Publons.com)
- Committee member for Habilitation committees (University of Cambridge and Imperial College London)
- Elected member, Young Academy of Europe (2013-)
- Over 30 plenary, semi-plenary, keynote lectures and 70 invited talks and seminars including to non-experts

Links

Full CV: https://www.dropbox.com/s/em7c101y12kgupd/VITA_SPAB_LATEST.docx?dl=0

Publications <https://scholar.google.lu/citations?user=QKZBZ48AAAAJ&hl=en>

<https://orcid.org/0000-0001-7622-2193> <https://researcherid.com/rid/A-1858-2009>

Reviewer profile <https://publons.com/a/659621/>

Team Website <http://legato-team.eu>

TWITTER <https://twitter.com/stephanebordas> <https://twitter.com/LegatoTeam>

https://wwwfr.uni.lu/recherche/fstc/research_unit_in_engineering_sciences_rues/members/stephane_bo

rdas

<https://www.cardiff.ac.uk/people/view/364334-bordas-stephane>

APPENDIX

Supervised PhD Theses (selected; only as main supervisor)

13 as main supervisor: <https://www.genealogy.math.ndsu.nodak.edu/id.php?id=177070>

Candidate name	Thesis title	Start/end year
Research output	Career path after PhD	
MENK Alexander	<i>Simulation of complex microstructural geometries using X-FEM and the application to solder joint lifetime prediction.</i>	2007/2010
3 papers in the main journals, 1 open-source code	Senior research engineer at Bosch GmbH	
NATARAJAN Sundararajan	<i>Enriched finite element methods: advances & applications</i>	2007/2010
7 papers in the main journals, 1 open-source code, Best ECCOMAS PhD thesis (Zienkiewicz Prize)	Postdoctoral fellow, university of New South Wales, Australia -> Associate Professor, IIT Madras, India	
AKBARI Ahmad	Adaptive multiscale simulation of fracture	2010/2014
2 papers in the main journals, 1 open-source code	Faculty member, Iran	
LIAN Haojie	Isogeometric shape optimisation	2011/2014
3 papers in the main journals, 1 open-source code	Post-doc DTU, Denmark -> Faculty member in China	
PENG Xuan	Isogeometric boundary element fracture	2011/2014
3 papers in the main journals, 1 open-source code Marie Skłodowska Curie Fellow	Faculty member in China	
LEE Chang-Kye	Smoothed finite elements for large strain elasticity	2011/2014
3 papers in the main journals, 1 open-source code	Post-doctoral fellow in Korea	
SUTULA Danas	Energy-minimal multiple fracture in brittle materials	2011/2014
4 papers in the main journals, 1 open-source code, funded by Soitec SA	Post-doctoral fellow	
PALADIM Daniel Alves	Multi-scale error estimation	2013/2016
3 papers in the main journals, 1 open-source code	Silicon Valley start-up (autonomous driving)	
AL SAAD Mohammed Khairullah Kadhim	Blood flow simulation with SPH	2014/2017
1 paper in the main journals, 1 open-source code	Faculty member, Irak	
RAPPEL Hussein	Bayesian inference in mechanics	2015/2018
4 papers in the main journals, 1 open-source code	Alan Turing Institute and Cambridge University – post-doctoral fellow	
FRANCIS Amrita	Polytopal finite elements	2016/2019
3 papers in the main journals, 1 open-source code	Post-doctoral fellow – Faculty member	

YU Peng	Space-time adaptive geometry-independent approximations	2016/2019
2 papers in the main journals, 1 open-source code	Post-doctoral fellow – Faculty member	
CHEN Li	Quasi-continuum Methods and error estimation for 3D printed structures	2017/2020
3 papers in the main journals, 1 open-source code	Post-doctoral fellow – Faculty member	