Christoph Ortner – Short CV

Department of Mathematics
UBC, 1984 Mathematics Road
Vancouver, BC, Canada V6T 1Z2

604-822-2666
ortner@math.ubc.ca
http://www.math.ubc.ca/ ortner/

Appointments & Education

since 2020	Professor, University of British Columbia
2014–2022	Professor, Warwick Mathematics Institute
2011–2014	Associate Professor (Reader), Warwick Mathematics Institute
2007–2011	RCUK Academic Fellow, Mathematical Institute, Oxford (permanent)
2007–2011	College Lecturer and Research Fellow of Merton College, Oxford
2006–2009	Post-doctoral Research Assistant, Mathematical Institute, Oxford
2003–2006	D.Phil. in Numerical Analysis, Oxford; Supervisor: Endre Süli
2002–2003	M.Sc. in Math. Model. & Sc. Comp., Oxford; Supervisor: Andy Wathen
1999–2002	Mathematics in Computer Science, Vienna University of Technology

Research Interests / Areas of Specialisation

Numerical and Applied Analysis, Molecular and multiscale modelling and simulation

Selected Awards and Fellowships

2017	John Todd Award, Mathematisches Forschungsinstitut Oberwolfach
2017-2018	Ordway Visiting Professor, University of Minnesota
2015	Whitehead Prize, London Mathematical Society
2012–2014	Philip Leverhulme Prize, The Leverhulme Trust
2006–2007	Worcester College Junior Research Fellowship

Major Research Funding

2021–2026	NSERC Discovery Grant, C$ 240k
2018–2022	EPSRC, *Boundary Conditions for Atomistic Simulation of Material Defects*, £537k
2018–2021	Leverhulme, *The Nature of Interatomic Forces in Metals*, £385k
2014–2018	ERC, *Multiscale simulation of crystal defects*, $\approx$ 1.2M
2012–2014	EPSRC, *Preconditioners for large-scale atomistic simulations*, £514k
2010–2013	EPSRC, *Analysis of Atomistic-to-Continuum Coupling Methods*, £358

Postdocs & PhD Students

Matthias Sachs (2020–2021; faculty at Birmingham), Liwei Zhang (2020–), Genevieve Dusson (2017-2020), Julian Braun (2016–2021; faculty at Heriot Watt), Letif Mones (2015–2018), Hong Manh Duong (2014–2017; faculty at Birmingham), Huajie Chen (2014–2016, faculty at Peking Normal), David Packwood (2012–2015), Lei Zhang (2010–2012, faculty at Jiaotong University); Jack Thomas (2018–2021), Stela Makri (2016–2019), Maciej Buze (2016–2019), Simon Etter (2015–2019), Faizan Nazar (2013–2016), Huan Wu (2013–2017), Simon Bignold (2012–2016), Thomas Hudson (2010–2014; Zeeman lecturer at Warwick), Hao Wang (2008–2013; faculty at Sichuan University), Bernhard Langwallner (2007–2011), Siobhan Burke (2006–2010)

Representative Publications

http://www.math.ubc.ca/~ortner/publications

[1] *Physics-inspired structural representations for molecules and materials*, with F. Musil, A. Grisafi, A. P. Bartók, G. Csányi, and M. Ceriotti, Chem. Rev. 121, 2021.

[2] *Performant implementation of the atomic cluster expansion (pace): Application to copper and silicon*, with Y. Lysogorskiy, C. van der Oord, A. Bochkarev, S. Menon, M. Rinaldi, T. Hammerschmidt, M. Mrovec, A. Thompson, G. Csányi, and R. Drautz, NPJ Computational Materials 7, 2021.

[3] *On the completeness of atomic structure representations*, with S. N. Pozdnyakov, M. J. Willatt, A. P. Bartók, G. Csányi, and M. Ceriotti Phys. Rev. Lett., 125:166001, 2020

[4] *Atomic cluster expansion: Completeness, efficiency and stability*, with M. Bachmayr, G. Csanyi, G. Dusson, R. Drautz, S. Etter, C. van der Oord, arXiv:1911.03550

[5] *QM/MM methods for crystalline defects. Part 2: Consistent energy and force-mixing*, with H. Chen, Multiscale Model. Simul. 15, 2021

[6] *Analysis of blended atomistic/continuum hybrid methods*, with X. H. Li, A. Shapeev, and B. Van Koten, Numer. Math. 134, 2016

[7] *An efficient dimer method with preconditioning and linesearch*, with N. Gould and D. Packwood, Math. Comp. 85, 2016

[8] *Analysis of Boundary Conditions for Crystal Defect Atomistic Simulations*, with V. Ehrlacher and A. V. Shapeev, Arch. Ration. Mech. Anal. 222, 2016

[9] *Calculations of crystalline material: from the continuum to the atomistic*, with M. Luskin, Acta Numerica 2013

[10] *The role of the patch test in 2D atomistic-to-continuum coupling methods*, M2AN 46, 2012

[11] *Nonconforming FE discretization for convex variational problems*, IMA J. Numer. Anal. 31, 2011