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Professor Nicholas Kevlahan

Correspondence language: English

Sex: Male

Date of Birth: 7/25

Canadian Residency Status: Canadian Citizen

Country of Citizenship: Canada

Contact Information

The primary information is denoted by (*)

Address

Primary Affiliation (*)

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Protected when completed

Professor Nicholas Kevlahan

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 1998/7 Post-doctorate, Applied Mathematics, Ecole Normale Supérieure de Cachan
Degree Status: Completed
- 1998/2 Post-doctorate, Applied Mathematics, École Normale Supérieure
Degree Status: Completed
- 1990/10 - 1994/11 Doctorate, PhD, Applied Mathematics, University of Cambridge
Degree Status: Completed
Thesis Title: Structure and Shocks in Turbulence
- 1985/9 - 1989/5 Bachelor's Honours, BSc, Physics, University of British Columbia
Degree Status: Completed
Thesis Title: Vortex merging

Recognitions

- 1992/10 J. T. Knight Prize - 0
University of Cambridge
Prize / Award
Graduate student research essay prize

User Profile

Engaged in Clinical Research?: No

Fields of Application: Foundations and Knowledge Acquisition

Areas of Research: Fluid Mechanics, Climate Changes and Impacts

Research Specialization Keywords: applied mathematics, scientific computation

Research Disciplines: Applied Mathematics

Employment

- 2008/7
 Professor of Mathematics
 Mathematics and Statistics, Science, McMaster University
 Full-time, Term, Professor
 Tenure Status: Tenure
 Fields of Application: Environment
 Areas of Research: Turbulence
 Research Disciplines: Applied Mathematics
- 2018/8 - 2019/7
 Visiting Professor
 Laboratoire Jean Kuntzmann, Université de Grenoble I - Joseph Fourier
 Full-time, Visiting Professorship
 Tenure Status: Non Tenure Track
- 2018/9 - 2018/10
 Visiting Professorship at Université de Grenoble-Alpes (competitive)
 Laboratoire Jean Kuntzmann, Université Grenoble-Alpes
 Full-time, Visiting Professorship, Professor
 Tenure Status: Non Tenure Track
- 2011/9 - 2012/6
 Visiting Professor
 Laboratoire de Météorologie Dynamique, École Polytechnique (France)
 Full-time, Visiting Professorship, Professor
 Tenure Status: Non Tenure Track
 Fields of Application: Environment
 Areas of Research: Fluid Mechanics
 Research Disciplines: Applied Mathematics
- 2002/7 - 2008/7
 Associate Professor of Mathematics
 Mathematics and Statistics, Science, McMaster University
 Full-time, Term, Associate Professor
 Tenure Status: Tenure
 Fields of Application: Environment
 Areas of Research: Fluid Mechanics
 Research Disciplines: Applied Mathematics
- 2005/4 - 2005/6
 Invited researcher
 Institut de Mathématiques Appliquées, Université de Grenoble I - Joseph Fourier
 Full-time, Visiting Professorship
 Tenure Status: Non Tenure Track
- 2004/10 - 2005/3
 Visiting researcher
 Department of Applied Mathematics and Theoretical Physics, University of Cambridge
 Full-time, Visiting Professorship
 Tenure Status: Non Tenure Track
- 2004/9 - 2004/9
 Invited Professor
 Institut de Mathématiques, Université de Bordeaux I
 Full-time, Visiting Professorship
 Tenure Status: Non Tenure Track

1998/7 - 2002/7	Assistant Professor of Mathematics Mathematics and Statistics, Science, McMaster University Full-time, Term, Assistant Professor Tenure Status: Tenure Track Fields of Application: Environment Areas of Research: Fluid Mechanics Research Disciplines: Applied Mathematics
2001/5 - 2001/7	Chercheur associé Laboratoire de Météorologie Dynamique, École Normale Supérieure Full-time, Visiting Professorship Tenure Status: Non Tenure Track
1994/10 - 1995/12	Visiting Researcher Laboratoire de Météorologie Dynamique, École Normale Supérieure (Paris) Full-time, Adjunct Tenure Status: Non Tenure Track Research collaboration with Marie Farge

Research Funding History

Awarded [n=8]

2018/4 - 2023/4 Principal Applicant	Towards a new generation of adaptive climate and weather models, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 100,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes
2021/4 - 2022/4 Principal Applicant	Adaptive climate modelling for atmosphere and ocean dynamics, Grant Funding Sources: Compute Canada Resources for Research Groups (RRG) competition Total Funding - 16,686 Portion of Funding Received - 16,686 Funding Competitive?: Yes
2013/4 - 2018/4 Principal Applicant	Multiscale wavelet modelling of turbulent flows in the atmosphere and oceans, Grant, Operating Project Description: Multiscale wavelet modelling of turbulent flows in the atmosphere and oceans.

Funding Sources:

2008/4 - 2013/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 95,000 (Canadian dollar)
Portion of Funding Received - 95,000 (Canadian dollar)
Funding Renewable?: No
Funding Competitive?: Yes
Funding Reference Number: 217003

2014/9 - 2016/9
Principal Applicant

Department Chair Research Grant, Grant, Operating

Funding Sources:

2014/9 - 2016/9 McMaster University
Dean of Science - administrative research grant
Total Funding - 25,000 (Canadian dollar)
Portion of Funding Received - 25,000
Funding Competitive?: No

2016/1 - 2016/4
Co-applicant

Multiscale Scientific Computing: from Quantum Physics and Chemistry to Material Science and Fluid Mechanics, Grant, Workshop
Project Description: Thematic program at the Fields Institute

Funding Sources:

2016/1 - 2016/4 Fields Institute for Research in Mathematical Sciences (The)
Thematic programs
Total Funding - 325,000 (Canadian dollar)
Portion of Funding Received - 108,333
Funding Renewable?: No
Funding Competitive?: Yes

2008/4 - 2013/4
Principal Applicant

Turbulence theory and applications: an adaptive wavelet approach, Grant, Operating

Funding Sources:

2008/4 - 2013/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 125,000
Portion of Funding Received - 125,000
Funding Renewable?: No
Funding Competitive?: Yes
Funding Reference Number: 217003

1999/4 - 2003/4
Principal Applicant

From coherent vortices to a statistical theory of turbulence, Grant, Operating

Funding Sources:

1999/4 - 2003/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 75,600
Portion of Funding Received - 75,600
Funding Renewable?: No
Funding Competitive?: Yes

2000/4 - 2001/4
Principal Applicant

Computing cluster for research and graduate students, Grant, Equipment

Funding Sources:

2000/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
 Equipment Grants - Equipment
 Total Funding - 46,755 (Canadian dollar) (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

Completed [n=8]

2020/4 - 2021/4

Principal Applicant

High Resolution Dynamically Adaptive Climate and Ocean Simulation, Grant

Funding Sources:

Compute Canada
 Fast track application
 Total Funding - 8,490
 Portion of Funding Received - 8,490
 Funding Competitive?: Yes

2019/4 - 2020/4

Principal Applicant

High Resolution Dynamically Adaptive Climate and Ocean Simulation, Grant

Funding Sources:

Compute Canada
 Resource Allocation Grant - Individual
 Total Funding - 7,276
 Portion of Funding Received - 7,276
 Funding Competitive?: Yes

2014/1 - 2014/12

Principal Applicant

Ultra high resolution adaptive wavelet simulation of ocean flows on the sphere, Grant, Operating

Funding Sources:

2014/1 - 2014/12 Compute Canada
 Resource Allocation Grant - Individual
 Total Funding - 54,950 (Canadian dollar)
 Portion of Funding Received - 54,950
 Funding Renewable?: No
 Funding Competitive?: Yes

2012/1 - 2012/2

Principal Applicant

Invited Professor, Fellowship

Funding Sources:

2012/1 - 2012/2 Ecole Polytechnique, Paris, France
 Invited Professorship
 Total Funding - 10,000 (Euro)
 Portion of Funding Received - 10,000
 Funding Renewable?: No
 Funding Competitive?: Yes

2010/1 - 2010/12

Principal Applicant

Travel grant to enable research collaboration at Ecole Polytechnique, Grant, Operating

Funding Sources:

2010/1 - 2010/12 Government of France
 Research travel grant
 Total Funding - 2,000 (Canadian dollar)
 Portion of Funding Received - 2,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2003/4 - 2008/4 A multi-purpose adaptive wavelet method for turbulent flows in three dimensions, Grant,
 Principal Applicant Operating

Funding Sources:

2003/4 - 2008/4 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 Discovery Grant
 Total Funding - 95,000 (Canadian dollar)
 Portion of Funding Received - 95,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2003/9 - 2005/12 Simultaneous space--time discretization of the Navier--Stokes equations, Fellowship
 Principal Applicant

Funding Sources:

2003/9 - 2005/12 Shared Hierarchical Academic Research Computing Network (The)
 (SHARCNET) (Ontario)
 Graduate Fellowship
 Total Funding - 27,720 (Canadian dollar)
 Portion of Funding Received - 27,720 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2002/5 - 2002/8 Parallelization and Evaluation of a Three-dimensional Pseudo-Spectral Code for Fluid -
 Principal Applicant Structure Interaction, Fellowship

Funding Sources:

2003/5 - 2003/8 Shared Hierarchical Academic Research Computing Network (The)
 (SHARCNET) (Ontario)
 Undergraduate Research Fellowship
 Total Funding - 5,000 (Canadian dollar)
 Portion of Funding Received - 5,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

Student/Postdoctoral Supervision**Bachelor's Honours [n=13]**

2019/11 - 2020/4 Katarina Sacka (Completed) , McMaster University
 Principal Supervisor

- 2017/9 - 2018/4
Principal Supervisor Aurora Basinski-Ferris (Completed) , McMaster University
Student Degree Received Date: 2018/4
Thesis/Project Title: Application of wavelets to the adaptive solution of partial differential equations (*fourth year thesis for Integrated Science Program*)
Present Position: Undergraduate student, McMaster University
- 2017/9 - 2016/4
Principal Supervisor Kathleen Pereira (Completed) , McMaster University
Student Degree Received Date: 2017/4
Thesis/Project Title: Why is the LRT an important development for the future of a growing Hamilton?
Present Position: Just graduated, looking for work.
- 2017/9 - 2018/4
Principal Supervisor Elizabeth Webb (Completed) , McMaster University
Student Degree Received Date: 2018/4
Thesis/Project Title: Mathematical models and data assimilation of tsunami waves (*fourth year honours thesis*)
Present Position: Undergraduate student, McMaster University
- 2017/9 - 2018/4
Co-Supervisor Jonathan Paneulos (Completed) , McMaster University
Student Degree Received Date: 2018/4
Thesis/Project Title: Central Schemes for Moving Particle based hydrodynamics
Present Position: Undergraduate student
- 2016/11 - 2017/4
Principal Supervisor Aurora Basinski-Ferris (Completed) , McMaster University
Student Degree Received Date: 2018/4
Thesis/Project Title: 1D PDEs on an Adaptive Grid using Wavelet Transforms (*third year Independent project for Integrated Science Program*)
Present Position: Fourth year undergraduate student at McMaster University
- 2016/9 - 2017/4
Principal Supervisor Paul Le (Completed) , McMaster University
Thesis/Project Title: The Effects of Turbulence on Star Formation
Present Position: Web developer
- 2014/11 - 2016/1
Co-Supervisor Joon Kim (Completed) , McMaster University
Student Degree Start Date: 2012/9
Thesis/Project Title: Analysis of Consumer Behavior in Bike Share – a Discrete Choice Analysis study
Present Position: BHSc student
- 2014/5 - 2014/8
Principal Supervisor Aaron Goldberg (Completed) , McMaster University
Student Degree Start Date: 2012/9
Thesis/Project Title: Numerical Approximations of Partial Differential Equations using Finite-Difference Methods (Enrichment Project, Integrated Sciences)
Present Position: PhD student, Physics Department, University of Toronto
- 2014/5 - 2014/8
Principal Supervisor Jesse Bettencourt (Completed) , McMaster University
Student Degree Start Date: 2011/9
Thesis/Project Title: Radial basis functions (USRA project)
Present Position: Research and teaching assistant, University of Toronto
- 2013/5 - 2013/8
Principal Supervisor Aaron Berk (Completed) , McMaster University
Student Degree Start Date: 2011/9
Student Degree Received Date: 2009/9
Thesis/Project Title: Adaptive wavelet calculations of shallow water equations with realistic bathymetry and coastlines (USRA project)
Present Position: PhD student, University of British Columbia

- 2011/9 - 2012/3
Principal Supervisor Jordan McClanahan (Completed) , McMaster University
Student Degree Start Date: 2008/9
Thesis/Project Title: Mass transit and its effects on urban growth (senior thesis)
Present Position: Chemical Lab Metallurgist ArcelorMittal Dofasco
- 2010/5 - 2010/8
Principal Supervisor Rebecca Tessier (Completed) , Queen's University
Thesis/Project Title: Compressive sampling with astrophysics applications (USRA project)
Present Position: MSc student, University of Waterloo

Master's Equivalent [n=3]

- 2017/5 - 2017/9
Academic Advisor Nicolas Gindrier (In Progress) , ENSIMAG, Grenoble, France
Thesis/Project Title: Evaluation of high order penalization methods for the Navier-Stokes equations (*first year research project*)
Present Position: Engineering student
- 2010/5 - 2010/8
Principal Supervisor Gael Ranchou (Completed) , Université de Bordeaux - MATMECA
Thesis/Project Title: Conservative wavelet-based methods for multiscale atmospheric or oceanic modelling (summer internship project)
Present Position: Safran Engineering Services
- 2010/5 - 2010/8
Principal Supervisor Achraf Benthami (Completed) , Université de Bordeaux - MATMECA
Thesis/Project Title: Parallel scaling and modelling of land masses in atmospheric and oceanic modelling on the sphere (summer research internship)

Master's non-Thesis [n=1]

- 2010/9 - 2010/5
Principal Supervisor Peter Kandolf (Completed) , McMaster University and Innsbruck University
Thesis/Project Title: Exponential integrators
Present Position: PhD student, University of Innsbruck

Master's Thesis [n=7]

- 2016/9 - 2018/6
Principal Supervisor Afroja Parvin (Completed) , McMaster University
Student Degree Start Date: 2018/6
Thesis/Project Title: Ocean waves in a multi-layer shallow water system with bathymetry
Present Position: Lecturer, North South University, Bangladesh
- 2014/9 - 2016/10
Principal Supervisor Ramsha Khan (Completed) , McMaster University
Student Degree Start Date: 2014/9
Thesis/Project Title: A Data Assimilation Scheme for the One-dimensional Shallow Water Equations
Present Position: Post-doctoral Fellow, Stockholm University
- 2013/9 - 2015/6
Principal Supervisor Ali Ghasemi (Completed) , McMaster University
Student Degree Start Date: 2013/9
Thesis/Project Title: The role of Reynolds number in the fluid-elastic instability of cylinder arrays
Present Position: PhD student, Technical University of Munich, Germany
- 2012/9 - 2014/6
Principal Supervisor Gudmundur Adalsteinsson (Completed) , McMaster University
Student Degree Received Date: 2010/9
Thesis/Project Title: Turbulence spectrum estimation by compressive sampling
compressive sampling
Present Position: Software Engineer, Valka ehf, Iceland

- 2008/9 - 2010/6
Principal Supervisor Mohammed Farazmand (Completed) , McMaster University
Thesis/Project Title: Controlling the Dual Cascade of Two-dimensional Turbulence
Present Position: Post-doctoral fellow, Sand Lab, Department of Mechanical Engineering, MIT
- 2006/9 - 2008/6
Principal Supervisor Amber Holdsworth (Completed) , McMaster University
Thesis/Project Title: A wavelet perspective on epidemiological time series
Present Position: Post-doctoral fellow, School of Earth and Ocean Sciences, University of Victoria
- 1999/5 - 2000/8
Co-Supervisor Don Hender (Completed) , McMaster University
Thesis/Project Title: Phase separation for one-dimensional Cahn-Hilliard equations and computations
Present Position: Engineer, Schlumberger, USA

Doctorate [n=6]

- 2018/5 - 2020/9
Academic Advisor Afroja Parvin (Withdrawn) , McMaster University
Thesis/Project Title: Adaptive hydrostatic ocean modelling and turbulence
Present Position: Lecturer, North South University, Bangladesh
- 2016/9 - 2020/9
Principal Supervisor Ramsha Khan (Completed) , McMaster University
Thesis/Project Title: Adaptive data assimilation for Tsunamis
Present Position: Post-Doctoral Fellow, Stockholm University
- 2011/2 - 2011/5
Academic Advisor Farideh Ghasempour (Completed) , Chalmers University
Student Degree Start Date: 2010/9
Thesis/Project Title: Structures, properties and dynamics of turbulent vortices (academic advisor during visit to McMaster University)
Present Position: Postdoctoral fellow, University of Waterloo
- 2010/9 - 2014/9
Principal Supervisor Matthias Aechtner (Completed) , McMaster University
Student Degree Start Date: 2010/9
Student Degree Received Date: 2014/9
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Adaptive wavelet modelling of geophysical flows on the sphere
Present Position: software engineer with GL-Measurement, Bad Kreuznach, Germany
Student Country of Citizenship: Germany
- 2009/9 - 2010/5
Principal Supervisor Atefeh Shadpour (Withdrawn) , McMaster University
Student Degree Start Date: 2009/9
Thesis/Project Title: Wavelet methods for partial differential equations
Present Position: PhD student, Earth Sciences, Waterloo
- 2003/1 - 2006/11
Academic Advisor Jahrul Alam (Completed) , McMaster University
Student Degree Start Date: 2003/1
Student Degree Received Date: 2006/11
Student Canadian Residency Status: Study Permit
Thesis/Project Title: A space-time adaptive wavelet method for turbulence
Present Position: Associate Professor, Memorial University, Canada

Post-doctorate [n=3]

- 2015/9 - 2017/9
Principal Supervisor Jan Feys (Completed) , McMaster University
Student Degree Start Date: 2015/9
Student Canadian Residency Status: Student Work Permit
Thesis/Project Title: Multilevel adaptive dynamical core for climate models
Present Position: Software Engineer

2005/9 - 2007/9 Principal Supervisor	Mani Mehra (Completed) , McMaster University Student Degree Start Date: 2005/9 Student Canadian Residency Status: Student Work Permit Thesis/Project Title: Adaptive wavelet method on the sphere Present Position: Associate Professor, IIT, Delhi, India
1998/9 - 2000/8 Academic Advisor	Sadek Cherhabili, McMaster University Present Position: Exponential integrators for turbulence, Engineer, Fluent

Event Administration

2017/12 - 2018/6	Co-organizer, CAIMS-Canadian Symposium on Fluid Dynamics Joint Meeting, Conference, 2018/6 - 2018/6
2017/3 - 2017/5	Co-organizer, Southern Ontario Numerical Analysis Day, Conference, 2017/5 - 2017/5
2015/1 - 2016/4	Co-organizer, Fields Institute Thematic Program: Multiscale Scientific Computing: from Quantum Physics and Chemistry to Material Science and Fluid Mechanics, Workshop, 2016/1 - 2016/4
2014/7 - 2014/12	Co-organizer, 2014 Canadian Mathematics Society Annual Winter Meeting, Conference, 2014/12 - 2014/12
2014/1 - 2014/4	Organizer, McMaster Colloquium on Open Access with speakers, Conference, 2014/4 - 2014/4
2013/2 - 2013/6	Co-organizer, Thematic session: Computational Mechanics and Mathematics in the Geosciences for Canadian Applied and Industrial Mathematics Society Annual Meeting, Conference, 2013/6 - 2013/7
2010/6 - 2010/12	Co-organizer, Oil, Weather and Geo-Science Modelling minisymposium, NAMIAM 2010 (First North American Meeting on Industrial and Applied Mathematics), Huatulco, Mexico, Conference, 2010/12 - 2011/1

Organizational Review Activities

2016/5 - 2016/5	External Reviewer, University of Waterloo MMath and PhD IQAP Graduate Program Review in Applied Mathematics for the Faculty of Mathematics at the University of Waterloo
2015/10 - 2015/10	External Reviewer, University of Ontario Institute of Technology MSc and PhD IQAP Graduate Program Review in Modelling and Computation for the Faculty of Science at University of Ontario Institute of Technology

International Collaboration Activities

2012/9 - 2022/9	Research collaborator, France Research collaboration with Thomas Dubos (<i>LMD, École Polytechnique</i>) on adaptive wavelet methods for climate modelling.
2018/8 - 2022/8	Researcher, France Research collaboration on ocean modelling problems with Laurent Debreu and other members of the INRIA AIRSEA group at the Institut de Mathématiques Appliquées at Université de Grenoble-Alpes.

Committee Memberships

2016/11 - 2017/11 Committee Member, Canadian Scholarly Publishing Working Group, Canadian Association of Research Libraries
 A working group formed by the Canadian Association of Research Libraries (CARL), the Canadian Association of Learned Journals, the Association of Canadian University Presses, Universities Canada, the Canadian Research Knowledge Network to explore organizational and financial models towards the creation of sustainable collaborative scholarly publishing model principles.

Other Memberships

2021/3 Member, Canadian Meteorological and Oceanographic Society
 2017/7 Member, American Physical Society
 2014/7 Member, European Geophysical Union
 2015/4 - 2017/3 Member, Society for Industrial and Applied Mathematics
 1998/5 - 2016/9 Member, Canadian Mathematics Society
 2009/6 - 2012/6 Executive board member, Canadian Applied and Industrial Mathematics Society

Presentations

1. (2021). WAVETRISK-OCEAN: an adaptive dynamical core for ocean modelling. Canadian Meteorological and Oceanographic Society Congress, Canada
 Invited?: No, Keynote?: No
2. (2021). WAVETRISK-OCEAN: an adaptive dynamical core for ocean modelling. PDEs on the sphere 2021, Offenbach, Germany
 Main Audience: Researcher
 Invited?: No, Keynote?: No, Competitive?: Yes
3. (2020). On the Convergence of Data Assimilation for the One-Dimensional Shallow Water Equations with Sparse Observations. Canadian Symposium on Fluid Dynamics, Canada
 Invited?: Yes, Keynote?: No
4. (2019). Towards a wavelet-based dynamically adaptive climate model. Research seminar - Laboratoire des Écoulements Géophysiques et Industriels, Université de Grenoble, Grenoble, France
 Invited?: Yes, Keynote?: No
5. (2019). An adaptive wavelet-based dynamical core for climate and ocean models (poster). Wavelets and beyond: a celebration for Alexandre Grossmann and Yves Meyer, Orsay, France
 Invited?: Yes, Keynote?: No
6. (2019). A wavelet-based dynamically adaptive dynamical core: results and perspectives. PDEs on the Sphere 2019, Montreal, Canada
 Invited?: Yes, Keynote?: No
7. (2019). A primer on Wavelets. International Workshop on Wavelets & CFD, Paris, France
 Invited?: Yes, Keynote?: Yes
8. (2019). Challenges of adaptive mimetic climate models. Workshop on Variational Discretization for Geophysical Fluid Dynamics (Fields Institute), Canada
 Invited?: Yes, Keynote?: No

9. (2019). Towards a wavelet-based dynamically adaptive climate model. Rencontres Mathématiques de Rouen 2019, Rouen, France
Invited?: Yes, Keynote?: No
10. (2019). Adaptive wavelets for climate simulation and penalization for ocean modelling. Mathematics and Statistics Colloquium, Canada
Invited?: Yes, Keynote?: No
11. (2019). Towards a wavelet-based dynamically adaptive climate model. International Workshop on Wavelets & CFD, Paris, France
Invited?: Yes, Keynote?: No
12. (2018). Adaptive wavelet simulation of global ocean dynamics using a new Brinkman volume penalization. COMMODORE 2018, Paris, France
Invited?: Yes, Keynote?: No
13. (2018). Dynamically adaptive wavelet methods on the sphere: towards heterogeneous multiscale climate models. First McMaster--CNRS Workshop, Hamilton, Canada
Invited?: Yes, Keynote?: No
14. (2018). A wavelet-based adaptive hydrostatic dynamical core: results and performance. European Geophysical Union General Assembly, Vienna, Austria
Invited?: Yes, Keynote?: No
15. (2018). A dynamically adaptive wavelet approach for flux-based dynamical cores. Moving and Adaptive Meshes, Reading, United Kingdom
Invited?: Yes, Keynote?: No
16. (2018). An adaptive wavelet-based dynamical core for exoplanet climate models. Science of Early Life, Hamilton, Canada
Invited?: Yes, Keynote?: No
17. (2018). Towards a wavelet-based dynamically adaptive climate model. Seminar of Laboratoire Jean Kuntzmann, Grenoble, France
Invited?: Yes, Keynote?: No
18. (2017). The role of turbulence in the fluid-elastic instability of tube arrays. European Turbulence Conference 16, Stockholm, Sweden
Main Audience: Researcher
Invited?: No, Keynote?: No
19. (2017). Variational data assimilation for the shallow water equations. American Physics Society Division of Fluid Dynamics Annual Meeting, Denver, United States
Invited?: No, Keynote?: No
20. (2017). Variational data assimilation for the shallow water equations. CMS Winter Meeting 2017, Waterloo, Canada
Invited?: Yes, Keynote?: No
21. (2017). Variational data assimilation for the shallow water equations. Canadian Mathematics Society Winter Meeting, Waterloo, Canada
Invited?: Yes, Keynote?: No
22. (2017). A wavelet-based adaptive hydrostatic dynamical core. Solution of Partial Differential Equations on the Sphere 2017, Paris, France
Main Audience: Researcher
Invited?: Yes, Keynote?: No
23. (2016). A dynamically adaptive wavelet method for the shallow water equations on the sphere: towards heterogeneous multiscale climate models. Fields Institute Scientific Computing Seminar, Toronto, Canada
Invited?: Yes, Keynote?: No

24. (2016). A dynamically adaptive wavelet method for the shallow water equations on the sphere: towards heterogeneous multi-scale climate models. Recent Advances in Hydrodynamics (Banff International Research Station), Banff, Canada
Invited?: Yes, Keynote?: No
25. (2016). The role of Reynolds number in the fluid-elastic instability of tube arrays. IMA Conference on Turbulence, Waves and Mixing In Honour of Lord Julian Hunt's 75th Birthday, Cambridge, United Kingdom
Main Audience: Researcher
Invited?: Yes, Keynote?: No
26. R. Pudritz. (2016). Astrophysics and astrochemistry links to the origins of life. Origins Institute Retreat, Mono, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
27. (2015). Compressive sampling for energy spectrum estimation of turbulent flows. Department of Mathematics and Statistics, McMaster University, Canada, PDE/Analysis Seminar, Hamilton, Canada
Invited?: Yes, Keynote?: No
28. (2015). Investigation of the Reynolds Number Effect on Fluid-elastic Instability of Moving Cylinder Arrays. 2015 AMMCS--CAIMS Congress, Waterloo, Canada
Invited?: Yes, Keynote?: No
29. (2015). A New Penalization Method for the Shallow Water Equations with Applications to Global Ocean Flow. 2015 AMMCS--CAIMS Congress, Waterloo, Canada
Invited?: Yes, Keynote?: No
30. (2015). A New Penalization Method for the Shallow Water Equations with Applications to Global Ocean Flow. SIAM Conference on Computational Science and Engineering, Salt Lake City, United States
Invited?: Yes, Keynote?: No
31. (2015). A new penalization method for the shallow water equations designed for dynamically adaptive global models. Solution of Partial Differential Equations on the Sphere 2015, Seoul, Korea, Republic of
Invited?: Yes, Keynote?: No
32. (2015). The role of Reynolds number in the fluid-elastic instability of tube arrays. 68th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Boston, United States
Invited?: No, Keynote?: No
33. (2014). A dynamically adaptive wavelet-based method for the shallow water equations on the icosahedral sphere. Solution of Partial Differential Equations on the Sphere 2014, Boulder, United States
Invited?: Yes, Keynote?: No
34. (2014). Panel participant. Panel Debate on Open Access in Academic Publishing, Hamilton, Canada
Invited?: Yes, Keynote?: No
35. (2014). A dynamically adaptive wavelet-based method for the shallow water equations on the icosahedral sphere. CMS Winter Meeting 2014, Hamilton, Canada
Invited?: Yes, Keynote?: No
36. (2014). Compressive sampling for energy spectrum estimation of turbulent flows. CMS Winter Meeting 2014, Hamilton, Canada
Invited?: Yes, Keynote?: No
37. (2014). A dynamically adaptive wavelet-based method for the shallow water equations on the icosahedral sphere. CAIMS 2014, Saskatoon, Canada
Invited?: Yes, Keynote?: No
38. (2014). A dynamically adaptive wavelet-based method for geophysical flows on the sphere. Applied mathematics seminar: Department of Mathematics, University of Toronto, Toronto, Canada
Invited?: Yes, Keynote?: No

39. (2014). Panel participant. Second Open Access Colloquium - École Normale Supérieure, Paris, France
Invited?: Yes, Keynote?: No
40. (2014). A dynamically adaptive wavelet-based method for the shallow water equations on the icosahedral sphere. Seminar: Institut de Mathématiques Appliquées de Grenoble, Université de Grenoble, France, Grenoble, France
Invited?: Yes, Keynote?: No
41. (2013). A conservative adaptive wavelet method for the shallow water equations on the sphere. 66th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Pittsburgh, United States
Invited?: No, Keynote?: No
42. (2013). A conservative adaptive wavelet method for the shallow water equations on staggered grids. Applied mathematics seminar: McGill University, Montreal, Canada
Invited?: Yes, Keynote?: No
43. (2013). A conservative adaptive wavelet method for the shallow water equations on staggered grids. CAIMS 2013, Quebec, Canada
Invited?: Yes, Keynote?: No
44. (2013). A conservative adaptive wavelet method for the shallow water equations on staggered grids. Seminar at Canadian Meteorological Centre, Environment Canada, Dorval, Canada
Invited?: Yes, Keynote?: No
45. (2013). A dynamically adaptive wavelet-based method for the shallow water equations on the icosahedral sphere. Applied math seminar: University of Ontario Institute of Technology, Oshawa, Canada
Invited?: Yes, Keynote?: No
46. (2013). A Conservative Adaptive Wavelet Method for the Rotating Shallow Water Equations on the Sphere. A Conservative Adaptive Wavelet Method for the Rotating Shallow Water Equations on the Sphere, Toronto, Canada
Invited?: Yes, Keynote?: No
47. (2012). Controlling the dual cascades in two-dimensional turbulence. ERCOFTAC Workshop on Fundamental Aspects of Turbulence, Paris, France
Invited?: Yes, Keynote?: No
48. (2012). A conservative adaptive wavelet method for the shallow water equations: towards a new generation of adaptive general circulation models. Séminaire de Laboratoire de Météorologie Dynamique, École Normale Supérieure, Paris, France
Invited?: Yes, Keynote?: No
49. (2012). From the origins of stars ... to the shocking origins of turbulence. Turbulence Colloquium Marseille 2011, Marseille, France
Invited?: Yes, Keynote?: No
50. (2012). Controlling the dual cascade of two-dimensional turbulence. Seminar: Mathematics Institute, University of St Andrews, St Andrews, United Kingdom
Invited?: Yes, Keynote?: No
51. (2012). Ondelettes adaptatives sur la sphere : un nouvel outil pour calculer les écoulements géophysiques. Séminaire: Laboratoire de Météorologie Dynamique, Université Pierre et Marie Curie, Paris, France
Invited?: Yes, Keynote?: No
52. (2012). Shock-generated turbulence in the interstellar medium and the origin of the stellar initial mass function. Seminar: Institute of Theoretical Astrophysics, University of Heidelberg, Heidelberg, Germany
Invited?: Yes, Keynote?: No
53. (2012). A conservative adaptive wavelet method for the shallow water equations on staggered grids. Solution of Partial Differential Equations on the Sphere 2012, Cambridge, United Kingdom
Invited?: Yes, Keynote?: No

54. (2012). A brief introduction to wavelet methods for the analysis and computation of turbulent flows. Department of Chemical Engineering, Chalmers University, Gothenburg, Sweden
Invited?: Yes, Keynote?: No
55. (2012). A brief introduction to wavelet methods for the analysis and computation of turbulent flows. Séminaire: Centres d'Études Aérodynamiques et Thermiques (CEAT), Université de Poitiers, Poitiers, France
Invited?: Yes, Keynote?: No
56. (2012). A conservative adaptive wavelet method for the shallow water equations on staggered grids. Computational Science and Engineering Colloquium, Hamilton, Canada
Invited?: Yes, Keynote?: No
57. (2012). Towards a new generation of adaptive climate models using wavelets. Wavelets in Scientific Computing, Vienna, Austria
Invited?: Yes, Keynote?: No
58. (2011). Controlling the dual cascade of two-dimensional turbulence. European Turbulence Conference 13, Warsaw, Poland
Invited?: No, Keynote?: No
59. (2011). Adaptive Wavelet Discretization of PDEs on the Sphere: a Framework for Geophysical Flows. Southern Ontario Numerical Analysis Day 2011, Hamilton, Canada
Invited?: Yes, Keynote?: No
60. (2011). Adaptive Wavelet Discretization of PDEs on the Sphere: a Framework for Geophysical Flows. International Congress on Industrial and Applied Mathematics 2011, Vancouver, Canada
Invited?: Yes, Keynote?: No
61. (2011). The role of vortex wake dynamics in the flow-induced vibration of tube arrays. Turbulence Shear Flow Phenomena 7, Ottawa, Canada
Invited?: No, Keynote?: No
62. (2010). The role of vortex wake dynamics in the flow-induced vibration of tube arrays. Bluff Body Vortex Induced Vibration 6, Capri, Italy
Invited?: No, Keynote?: No
63. (2010). The role of vortex wake dynamics in the flow-induced vibration of tube arrays. CAIMS 2010, St John's, Canada
Invited?: Yes, Keynote?: No
64. (2010). Adaptive Wavelet Discretization of PDEs on the Sphere: a Framework for Geophysical Flows. First North American Meeting on Industrial and Applied Mathematics, Huatulco, Mexico
Invited?: Yes, Keynote?: No
65. (2010). The role of vortex wake dynamics in the flow induced vibration of tube arrays. Applied Math Seminar: Faculty of Science, University of Ontario Institute of Technology, Oshawa, Canada
Invited?: Yes, Keynote?: No
66. (2010). Shock generated vorticity in the interstellar medium and the origin of the stellar initial mass function. Seminar: Department of Applied Mathematics, University of Waterloo Waterloo, Waterloo, Canada
Invited?: Yes, Keynote?: No
67. (2009). Shock generated vorticity in the interstellar medium and the origin of the stellar initial mass function. CMS Summer Meeting, St John's, Canada
Invited?: Yes, Keynote?: No
68. (2009). Shock generated vorticity in the interstellar medium and the origin of the stellar initial mass function. 62nd Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Minneapolis, United States
Invited?: No, Keynote?: No

69. (2008). Vortices for computing: the engines of turbulence simulation. CMS Winter Meeting', Ottawa, Canada
Invited?: Yes, Keynote?: No

Publications

Journal Articles

1. N. K.-R. Kevlahan. (2021). Adaptive Wavelet Methods for Earth Systems Modelling. *Fluids*. 6
<http://dx.doi.org/doi.org/10.3390/fluids6070236>
Published,
Refereed?: Yes
2. Debreu, L., Kevlahan, N.-K.-R. & Marchesiello, P. (2020). Brinkman volume penalization for bathymetry in three-dimensional ocean models. *Ocean Modelling*. 145: 101530.
Published,
Refereed?: Yes, Open Access?: No
3. Panuelos J, Wadsley J, Kevlahan N. (2020). Low Shear Diffusion Central Schemes for Particle Methods. *Journal of Computational Physics*. 414: 109454.
Published,
Refereed?: Yes
4. N.K.-R. Kevlahan and T. Dubos. (2019). WAVETRISK-1.0: an adaptive wavelet hydrostatic dynamical core. *Geoscientific Model Development*. 12: 4901–4921.
Published,
Refereed?: Yes, Open Access?: Yes
5. Kevlahan NK-R, Khan* R and Protas B. (2019). On the convergence of data assimilation for the one-dimensional shallow water equations with sparse observations. *Adv Comput Math*. 45(5): 3195-3216.
Published,
Refereed?: Yes, Open Access?: No
6. Poulin, F, Ko, W, Fox-Kemper, B and Kevlahan, NK-R. (2018). Spectral characteristics of a turbulent, wind-driven gyre flow. *Geophysical and Astrophysical Fluid Dynamics*.
Submitted,
Refereed?: Yes
7. Ghasemi* A, Kevlahan NK-R. (2017). The role of Reynolds number in the fluid-elastic instability of tube arrays. *J Fluids Struct*. 73: 16-36.
Published,
Refereed?: Yes, Open Access?: No
8. Aechtner* M, Dubos T, Kevlahan NK-R. (2015). A conservative adaptive wavelet method for the shallow-water equations on the sphere. *Q J R Meteorol Soc*. 141(690): 1712-1726.
Published,
Refereed?: Yes, Open Access?: No
9. Behera R, Mehra* M, Kevlahan NK-R. (2015). Multilevel approximation of the gradient operator on an adaptive spherical geodesic grid. *Advances Comput Math*. 41(3): 663-689.
Published,
Refereed?: Yes, Open Access?: No
10. Adalsteinsson* G, Kevlahan NK-R. (2015). Compressive sampling for energy spectrum estimation of turbulent flows. *SIAM J Sci Comput*. 37(3): B452-B472.
Published,
Refereed?: Yes, Open Access?: No

11. Kevlahan NK-R, Dubos T, Aechtner* M. (2015). Adaptive wavelet simulation of global ocean dynamics using a new Brinkman volume penalization. *Geosci Model Dev.* 8: 3891-3909.
Published,
Refereed?: Yes, Open Access?: Yes
12. Dubos T, Kevlahan NK-R. (2013). A conservative adaptive wavelet method for the shallow water equations on staggered grids. *Q J R Meteorol Soc.* 139(677): 1997-2020.
Published,
Refereed?: Yes, Open Access?: No
13. Pudritz R, Kevlahan NK-R. (2013). Shock interactions, turbulence and the origin of the stellar mass spectrum. *Phil Trans R Soc A.* 371: 20120248.
Published,
Refereed?: Yes, Open Access?: No
14. Kevlahan NK-R. (2012). Principles of Multiscale Modeling by Weinan E (invited book review). *Physics Today.* 65(6): 56.
Published,
Refereed?: No, Open Access?: No
15. Holdsworth* AM, Kevlahan NK-R, Earn DJD. (2012). Multifractal signatures of infectious diseases. *J R Soc: Interface.* 9(74): 2167-2180.
Published,
Refereed?: Yes, Open Access?: No
16. Alam* J, Kevlahan NK-R, Vasilyev OV, Hossain Z. (2012). A Multi-resolution model for the simulation of transient heat and mass transfer. *Numer Heat Tr B-Fund.* 61(3): 147-170.
Published,
Refereed?: Yes, Open Access?: No
17. Ghasempour* F, Andersson R, Kevlahan N, Andersson B. (2012). Multidimensional turbulence spectra-identifying properties of turbulent structures. *J Phys Conf Ser.* 318: 04022.
Published,
Refereed?: No, Open Access?: No
18. Kevlahan NK-R. (2011). The role of vortex wake dynamics in the flow-induced vibration of tube arrays. *J Fluids Struct.* 27: 829-837.
Published,
Refereed?: Yes, Open Access?: No
19. Farazmand* MM, Kevlahan NK-R, Protas P. (2011). Controlling the dual cascade of two-dimensional turbulence. *J Fluid Mech.* 668: 202-222.
Published,
Refereed?: Yes, Open Access?: No
20. Kevlahan, N.K.-R. (2010). Vortices for computing: the engines of turbulence simulation. *Theor. Comput. Fluid Dyn.* 24(1-4): 241-245.
Published,
Refereed?: Yes, Open Access?: No
21. Kevlahan, N. & Pudritz, R.E. (2009). Shock-generated vorticity in the interstellar medium and the origin of the stellar initial mass function. *Astrophys. J.* 702: 39-49.
Published,
Refereed?: Yes, Open Access?: No
22. Mehra, M. & Kevlahan, N.K.-R. (2008). An adaptive wavelet collocation method for the solution of partial differential equations on the sphere. *J. Comput. Phys.* 227: 5610-5632.
Published,
Refereed?: Yes, Open Access?: No

23. Mehra, M. & Kevlahan, N.K.-R. (2008). An adaptive multilevel wavelet solver for elliptic equations on an optimal geodesic spherical grid. *SIAM J. Sci. Comput.*30: 3073–3086.
Published,
Refereed?: Yes, Open Access?: No
24. Vasilyev, O.V., de Stefano, G., Goldstein, D. & Kevlahan, N.K.-R. (2008). Lagrangian dynamic SGSmodel for Stochastic Coherent Adaptive Large Eddy Simulation. *J. Turbulence.* 9(11): 1-14.
Published,
Refereed?: Yes, Open Access?: No