

# Jean-Luc Guermond

*Professor of Mathematics, Ewing-ExxonMobil  
Chair in Computational Science*

*Department of Mathematics  
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## Professional Preparation

- 1995 **Habilitation Dissertation, Mathematics**, Paris 6 University, Paris, France.
- 1990 **Aggregation, Mathematics**, Paris 6 University, Paris, France.
- 1985 **Ph.D. Theoretical Mechanics**, Paris 6 University, Paris, France.
- 1983 **M.S., Theoretical Mechanics**, Paris 6 University, Paris, France.
- 1983 **Dipl. of Eng., Multidisciplinary Eng.**, ENSTA, Paris, France.

## Appointments

- 2004– **Professor**, Department of Mathematics, Texas A&M, College Station, TX.
- 2001-2003 **Visiting Professor**, ICES, University of Texas, Austin, TX.
- 2001-2004 **Directeur de Recherche**, CNRS, LIMSIS, Orsay, France.
- 1990-2001 **Chargé de Recherche**, CNRS, LIMSIS, Orsay, France.
- 1987-1990 **Research Associate**, Bassin d'Essais de Carènes, Paris, France.
- 1986-1987 **Post-Doctoral Fellow**, Department of Ocean Engineering, MIT, Boston, MA.
- 1984-1986 **Research Associate**, Bassin d'Essais de Carènes, Paris, France.

## Research Topics

Numerical Analysis; Finite element approximation; Nonlinear conservation laws; Hyperbolic systems; Navier-Stokes equations; Maxwell's equations; Fluid flows; Magneto-hydrodynamics.

## Awards

- 2021 **SIAM Fellow**.
- 2020 **AMS Fellow**.
- 2017&2020 **TAMU Engineering Genesis Award for Multidisciplinary Research**.
- 2019-2024 **Inria International Chair**, Paris, FR.
- 2016 **TAMU Departmental Award for Service**.
- 2012 **Mobil Chair in Computational Science**.
- 2002, 2003 **TICAM fellowship**, Austin, TX.

## Publications

- Books 5 Books
- Articles 190 Research papers in refereed journals; 30 Articles in special collections/proceedings, 38 Conference papers and internal reports.
- Citations (04/2024)
  - Google Scholar: 15699, citations, H-index 58
  - MathScinet: 5355 citations.

## Synergistic Activities

- University Service
  - College of Science Faculty Advisory Council: 2019-2020.
  - TAMU Regularion Review Task force: 2018;
  - Committee of Principal Investigators: 2009-2012; 2012-2015; 2021-2024
  - Faculty-Student IP Agreement Task Force: 2014, 2015;
  - Evaluation Committee of TOP grants: 2012, 2014, 2015;
  - Task Force for Faculty Performance Evaluations: 2009-2010.
  
- Departmental Service
  - Executive Committee: 2005-2007; 2021-2023.
  - Committee P (Promotion): 2005-2007 (Chair in 2006/2007), 2014-2016, (Chair in 2015/2016);
  - Award Committee: 2009-2011; 2019-2021 (chair in 2020/2021);
  - Head Search Committee: 2010;
  - IUMRI Search Committee: 2011;
  - Undergraduate Committee: 2011-2012;
  - Post-Doc Committee: 2012-2013, 2017-2018;
  - IT Security Committee: 2018;
  - Endowed chair committee: Permanent.
  
- Editorial Activities
  - Managing editor: *Computers&Mathematics with Applications* (Jan. 2021 –);
  - Associate Editor: *International Journal of Numerical Analysis&Modeling* (2006–); *Journal of Mathematical Analysis and Applications* (2007–); *SIAM Journal on Scientific Computing* (2012–2016).
  - Editorial Advisory Board: *Journal Numerical Mathematics* (2022–).
  
- Advising
  - Sponsored 7 Post-doctoral scholars;
  - Chaired 15 Ph.D theses and co-chaired 9 Ph.D theses;
  - Chaired 10 Master theses.

## Collaborators, co-authors & other affiliations

- Main collaborators & co-authors
  - *P. Azerad* (Univ. Montpellier, Montpellier, France); *Y. Achdou* (Univ. Paris VI, Paris, France); *A. Bonito* (Texas A&M Univ.); *A. Ern* (Ecole des Ponts et Chaussées, Paris); *Ch. Kees* (ERDC, MI); *P. Le Quéré* (CNRS, LIMSIS, Orsay); *M. Maier* (Texas A&M) *P. Mineev* (Univ. of Edmonton, Alberta, Canada); *C. Nore* (Univ. Paris Sud, France); *J. Tinsley Oden* (ICES, Univ. Texas at Austin, Texas); *J. Pasciak* (Texas A&M Univ.); *B. Popov* (Texas A&M Univ.); *S. Prudhomme* (Ecole Polytechnique Montréal, Canada); *L. Quartapelle* (Politecnico di Milano, Milan, Italy); *I. Tomas* (SANDIA National Lab.) *J. Shen* (Purdue Univ., Indiana)
- Advisers
  - Graduate Adviser: *J.P. Guiraud*, University of Paris VI, Paris, France;
  - Postgraduate Adviser: *J.E. Kerwin*, MIT, Boston, MA

## Grants

- NSF
  - (DMS 2110868), Aug 2021, July 2024, co-PI, \$592,061;
  - (DMS 1620058), July 2016-Aug 2019 (no cost ext. July 2021), PI, \$270,000;
  - (DMS 1619892), July 2016-Aug 2019 (no cost ext. July 2021), co-PI, \$250,000;
  - (DMS-1217262), Co-PI, Aug 2012-July 2016, \$350,000;
  - (DMS 1015984), Sept 2010-Aug 2013, PI, \$269,991;
  - (DMS 0811041), July 2008-June 2011, Co-PI, \$329,997;
  - (DMS 0713829), Aug.2007-Aug 2010, PI, \$300,000;
  - (DGE-IGERT 0523626): Sept 2005-Aug 2010), Co-PI, \$2,355,412;
  - (DMS 0510650), June 2005-May 2008, PI, \$677,545

- AFSOR
  - (FA9550-23-1-0007) Nov 2022 –Oct 2025, PI, \$609,386.00;
  - (FA9550-18-1-0397) Aug 2018-Jul 2021, PI, \$515,733;
  - (FA9550-15-1-0257) June 2015-Sept 2017, PI, \$445,000;
  - (FA9550-12-1-0358), PI, July 2012-Apr. 2015, PI, \$450,000;
  - (FA9550-12-0358), Apr 2009-Apr 2011, PI, \$345,000
  
- ARO
  - (W911NF-19-1-0431), Sept 2019-Feb 2024, PI, \$561,478;
  - (W911NF-15-1-0517), Apr 2015-Apr 2019, PI, \$440,000;
  - May 2008, PI, \$14,500
  
- DOE
  - Los Alamos National Laboratory Development Fellowship, July 2023, June 2024, PI (1.5 summer salary+travel).
  - Collaborative Research And Development Supporting Stockpile Stewardship (Hydro), Lawrence Livermore National Laboratory, Co-PI, May 2020- Apr 2023, co-PI;
  - Collaborative Research And Development Supporting Stockpile Stewardship (Transport), Lawrence Livermore National Laboratory, Co-PI, May 2020- Apr 2023, co-PI;
  - Collaborative R&D In Support of LInI Missions (Fy17-19), Lawrence Livermore National Laboratory, Aug 2017- May 2020, co-PI, \$38,194;
  - Computational R&D In Support Of Stockpile Stewardship, Lawrence Livermore National Laboratory, Jul 2017-May 2020, Co-PI, \$266,641;
  - (C09-00035) Sept 2008-June 2011, Co-PI, \$2,936,677;
  - (C07-545), Co-PI, \$7,496,076;
  - (C08-00358), Sept 2007-Sept 2008, Co-PI, \$7,885.
  
- IMA, TAMU
  - IMA workshop Grant, Oct 2020, PI, \$4,000;
  - IMA workshop Grant, May 2008, PI, \$4,000;
  - Matching funds from Texas A&M, May 2008, PI, \$4,000.
  
- Miscellaneous
  - TAMU National Laboratories Office, Exploration Mini-Grant, Aug 2020, PI, \$2,000;
  - IAMCS Innovation grant, Aug 2010-Aug 2011, PI, \$25,000;
  - International Research Travel Assistance Grant, Dec 2005-Dec 2006, PI, \$1,100; Start-up fund, Sept 2004-Sept 2007, PI, \$70,000.

## Professional Associations

- Member of
  - Society for Industrial and Applied Mathematics (SIAM);
  - American Mathematical Society (AMS);
  - U.S. Association for Computational Mechanics (USACM); Chair of Mathematical Methods TTA (2021-2023); Co-Chair of Mathematical Methods TTA (2020).

## SERVICE

### University Activities

1. College of Science Faculty Advisory Council: 2019-2020.
2. Committee of Principal Investigators (TAMU): 2009-2012; 2012-2015; 2021-2023.
3. Committee of Principal Investigators (Substitute) (2019-2020).
4. Evaluation Committee for 2023-2024 Dissertation Fellowships.
5. Evaluation Committee of TOP grants: 2012, 2014, 2015.
6. Task Force for TAMU Regulation Review: 2018.
7. Task Force for Faculty-Student IP Agreement: 2014, 2015.
8. Task Force for Faculty Performance Evaluations: 2009/2010.
9. Working Group Member for Recommendation #35: 2022.

### Departmental Activities

1. Award Committee: 2009-2011; 2019-2021 (chair in 2020/2021).
2. Committee P (Promotion): 2005-2007 (Chair in 2006/2007), 2014-2016 (Chair in 2015/2016).
3. Endowed chair committee: Permanent.
4. Executive Committee: 2005-2007, 2021-2023.
5. Head Search Committee: 2010.
6. IUMRI Search Committee: 2011.
7. IT Security Committee: 2018.
8. Post-Doc Committee: 2004-2005, 2012-2013, 2017-2018.
9. Undergraduate Committee: 2011-2012.

### Editorial activities (current)

1. Managing editor *Computers & Mathematics with Applications* (Jan 2021 –).
2. Associate Editor of *Journal of Mathematical Analysis and Applications* (2007 –).
3. Associate Editor of *International Journal of Numerical Analysis & Modeling* (2006 –).
4. Editorial Advisory Board: *Journal Numerical Mathematics* (2022–).

### Editorial activities (past)

1. Associate Editor *SIAM Journal on Scientific Computing*.

### Reviewing and Refereeing

1. Reviews for: *CMAME*, *Comptes Rendus Acad. Sciences*, *IJMMS*, *IMAJNA*, *Int. J. Numer. Fluids*, *JMAA*, *J. Comput. Phys.*, *Euro. J. Fluid Mech.*, *M2AN*, *Math. Comp.*, *IMA J. Numer. Anal.*, *Nuclear Eng.*, *Physica D*, *SIAM J. Numer. Anal.*, *SIAM J. Sci. Comput.*
2. Reviews for *Math Review*.
3. NSF panels:
  - o External reviewer, April 2022.
  - o Numerical PDEs, Feb 25-28, 2020.
  - o CAREER, Applied Math, Computational Math & Math Bio, October 26-18, 2016.
  - o CAREER, Applied Math, Computational Math & Math Bio, October 10-12, 2006.
  - o Numerical PDEs, March 8-10, 2006.
4. DOE panel, March 29-30, 2012.
5. Evaluation Committee of Department of Applied Mathematics, JLL, Paris VI, Paris, November 21-22, 2012.
6. Panelist for these agencies: Fond National Suisse de la Recherche (Switzerland), Ministry of Foreign Affairs (France), CONICYT (Chile).

### Conferences and workshop organized or co-organized

1. Organized one-day workshop: *Methods of characteristics*, Orsay, March 1993.
2. Organized one-day workshop: *Projection methods*, Orsay, April 1994.
3. Organized one-day workshop: *Domain Decomposition Methods*, Orsay, Mai 1995.
4. In the organization committee of *ECCOMAS CFD* 2001.
5. Organized two-day workshop: *Large Eddy Simulation*, June 2000, Orsay.
6. Organized French CFD Spring School in 1999, 2001, 2003, 2005.

7. Organized: Minisymposium on Multiscale methods in computational fluid dynamics, ENUMATH2005, 18-22 July (2005), Santiago De Compostela, Spain.
8. Organized Texas Finite Element Rodeo, 3-4 March 2006, College Station.
9. In the organization committee of ECCOMAS CFD 2006. Organized two mini-symposiums.
10. Workshop on "Nonlinear Approximation Techniques Using L1", May 16th-18th, 2008, Texas A&M University.
11. Organized workshop on "Complex Fluid Dynamics" March 22-25, 2010, Thuwal, Saudi Arabia.
12. Organized workshop "Computational Fluid Dynamics at TAMU" April 8-10, 2015, Texas A&M University.
13. Organized three minisymposia at the SIAM Conference on Computational Science and Engineering, Feb 27-March 3, 2017, Atlanta, GA.
14. Organized two minisymposia at SIAM CSE 2019 (SIAM Conference on Computational Science and Engineering), Feb 25- March 1, 2019, Spokane, WA.
15. Organised, 3rd Annual Meeting of the SIAM Texas-Louisiana Section October 16 - 18, 2020 (virtual meeting)
16. Organised minisymposia, 3rd Annual Meeting of the SIAM Texas-Louisiana Section October 16 - 18, 2020 (virtual meeting)
17. Organised minisymposia, 5th Annual Meeting of th SIAM Texas-Louisiana Section. University of Houston. November 4th - November 6th, 2022.
18. Organised minisymposia, 17th U.S. National Congress on Computational Mechanics, Albuquerque, NM, July 23 - 27, 2023.
19. Organised minisymposia, WONAPDE 2024, Concepcion, Chile, January 15-19, 2024.

## ADVISING

### PhD Theses (Chair or co-Chair)

- 2023- Ryan Budahazy (univ. Texas A&M), *Hypersonic flows and elastodynamics*.
- 2021- Seth Gerberding (univ. Texas A&M), *Approximation of dispersive conservation equations*.
- 2020- Madison Sheridan (univ. Texas A&M), *Lagrangian and radiation hydrodynamics*.
- 2019-2022 Bennett Clayton (univ. Texas A&M), *Approximation of the Euler equations with complex equation of state* (co-advised with B. Popov).
- 2018-2021 Eric Tovar (univ. Texas A&M), *Approximation of the shallow water equations*.
- 2018-2021 Hugues Faller (univ. Paris Sud), *Dissipation, Cascades and Singularities in Turbulence*, (co-advised with C. Nore, Université Pairs-Saclay).
- 2015-2018 Raphael Zannella (univ. Paris Sud), *Ferro-fluids and heat transfers in High-Voltage transformers*, (co-advised with C. Nore).
- 2012-2016 Yong Yang (univ. Texas A&M), *Approximation of nonlinear conservation equations using continuous finite elements*.
- 2012-2016 Manuel Quezada (univ. Texas A&M), *Approximation of the variable density Navier-Stokes equations*.
- 2012-2015 Loic Capanera (univ. Paris XI), *Approximation of the MHD equations with variable density flows*, (co-advised with C. Nore).
- 2011-2016 Daniel Castanon (univ. Texas A&M), *Approximation of the MHD equations with variable magnetic permeability*, (co-advised with C. Nore).
- 2011-2015 Fahad Alrashed (univ. Texas A&M), *Approximation of the variable density Navier-Stokes equations*.
- 2011-2013 T. Thompson (univ. Texas A&M), *ADI techniques for Navier-Stokes*.
- 2009-2012 F. Luddens (univ. Paris XI), *Approximation of the Maxwell equations.*, (co-advised with C. Nore, Univ. Paris XI).
- 2010-2012 V. Zingan (univ. Texas A&M), *Implementation of the entropy viscosity method with the Discontinuous Galerkin Method*.
- 2008-2010 Abner Salgado (Univ. Texas A&M) *Analysis and approximation of variable density flows*.
- 2007-2010 A. Ribeiro (univ. Paris XI), *Approximation of the geodynamo.*, (co-advised with C. Nore, Univ. Paris XI).
- 2003–2006 R. Laguerre (Univ. Paris VII): *Finite element approximation of the geodynamo*. Defended December 2006 (co-advised with C. Nore, Univ. Paris XI).
- 1999–2002 G. Journade (Univ. Paris VI): *Computation of the wake of a transport plane*. The research was done at ONERA. Defended in June 2002 (co-advisor).
- 1996–2000 L. Jeanfaivre (Univ. Paris VI). *Eulerian/Lagrangian approximation of the 3D Navier–Stokes equations*. Defended in June 2000.
- 1995–2000 G. Roignant (Univ. Paris VI). *Approximation of the Navier–Stokes equations by using approximate exponentiations*. Defended in January 2000.
- 1994–1998 A. Ben Abdallah (Univ. Paris VI): *Approximation of the Navier–Stokes equations on parallel computers by a projection/mortar finite element technique*. Defended in October 1998.
- 1993–1996 W.Z. Lu (Univ. Paris XI): *Eulerian/Lagrangian approximation of the Navier–Stokes equations*. Defended in June 1996 (co-advised with R. Temam, (Prof., Paris XI)).
- 1990–1993 W.Z. Shen (Univ. Paris XI): *Approximations of external high Reynolds incompressible 2D flows by domain decomposition*. Defended in February 1993 (co-advised with S. Huberson, Le Havre)

1988–1990 Sophie Fontaine (Univ. Rouen): *Numerical approximation of high Reynolds flows around submarines*. Most of the research program has been carried out (see publications) but S. Fontaine found a better paying position in the industry before defending her PhD, (co-advised with S. Huberson, Le Havre).

1988–1990 A. Sellier (ENS St. Cloud): *Unification of the unsteady lifting-line theory*. Defended in February 1990 (co-advised with J.P. Guiraud, Paris VI).

### Master Theses (Chair)

2023 T. Gleason (univ. Texas A&M).

2013 H. Talavatifard (univ. Texas A&M), L1 minimization, Master thesis.

2005 Tony Castaldo (univ. Texas A&M).

1999 M. Barton-Smith: Analysis of a subgrid stabilization techniques for first-order PDEs; Paris XI.

1997 C. Boudesocque: Analysis of the  $p$ -Laplacian stabilization of transport equations; Paris VI.

1996 F. Beaubert: Finite element approximation of the air flow in the vocal tract; Paris VI.

1995 B. Abbes: Finite element approximation of the air flow in the vocal tract; Paris VI.

1993 M. Khadda: Iterative schemes for the Navier–Stokes equations; Paris VI.

1992 I. Calmet: Multigrid approximation of the Navier–Stokes equations; Paris VI.

1989 D. Goldberd: Analysis of a boundary element method for potential flows; Paris VI.

### Habilitation Committee

2010 J.C. Latché, Univ Aix-en-Provence.

2005 C. Daveau, Math., Paris VI.

1998 A. Sellier, Mech., Ecole Polytechnique.

1998 A. Desseaux. Mech., Lille.

### Udergraduate Students

2016 Morgan Nasser, Texas A&M.

## INVITED SPEAKER AT CONFERENCES, COLLOQUIUMS, SEMINARS AND LECTURES

### Invited speaker at conferences, lectures, workshops

- 2023 AFOSR Annual review Computational Mathematics 2023, Arlington, Washington DC, VA, August 7–11, 2023.
- 2023 7th KUMUNU-ISU Conference, Iowa State University, April 22-23, 2023.
- 2023 Workshop in Honor of Leszek F. Demkowicz's 70th Birthday, Oden Institute, The University of Texas at Austin, April 11, 2023.
- 2022 Workshop: Journées thématiques Hyperbo 2022 - Mécanique des fluides, Marseille, FR, Dec. 13, 2022
- 2022 AFOSR Annual review Computational Mathematics 2022, Arlington, Washington DC, VA, August 15–19, 2022.
- 2022 Workshop: New trends in numerical methods for hyperbolic conservation laws. Center for Computational and Applied Mathematics, Purdue University, West Lafayette, IN, May 9-10, 2022
- 2022 Oberwolfach Workshop: Structure-Preserving Discretizations for Nonlinear Systems of Hyperbolic, Involutions-Constrained Partial Differential Equations on Manifolds, Oberwolfach, Germany, April 11-15, 2022
- 2022 IFIP TC7 WG7.2 - Virtual Seminar Series, April 5, 2022
- 2021 Ivo Babuška's 95th Birthday Workshop Albuquerque, NM, October 11, 2021
- 2021 BIRS-CMO workshop Bound-preserving space and time discretizations for convection-dominated problems Aug 23-26, 2021, Oaxaca, Mexico, (zoom)
- 2021 AFOSR Annual review Computational Mathematics 2021, August 9–13, 2021 (zoom)
- 2021 Proteus Workshop, LSU, Baton Rouge, LA, July 21–23, 2021
- 2021 Recent development in numerical kinetic theory, June 21-25, 2021, University of Wisconsin–Madison, (zoom)
- 2021 Fisk Distinguished Speaker, Feb 4, 2021, University of Wyoming (zoom)
- 2021 Oberwolfach Workshop Jan. 10-16, 2021: Nonstandard Finite Element Methods, Oberwolfach, Germany. (zoom)
- 2020 International conference on Advances in Differential Equations and Numerical Analysis (ADENA) Oct 12-15, 2020, Indian Institute of Technology, Guwahati, India (zoom)
- 2020 AFOSR, Computational Mathematics Program Review Meeting, Aug 10-Aug 13, 2020, Washington DC (zoom)
- 2019 Structure Preserving Numerical Methods for Hyperbolic PDEs, Southern University of Science and Technology (SUSTech), November 2-4, 2019, Shenzhen, Guangdong, China
- 2019 Rencontres Mathématiques de Rouen, June 19-21, 2019, Rouen, France
- 2019 The 11th International Conference on Scientific Computing and Applications (ICSCA 2019), Xiamen University and Tianyuan Mathematical Center in Southeast China, in Xiamen, Fujian, China, May 27-30, 2019
- 2019 AFOSR, Computational Mathematics Program Review Meeting, Aug 12-Aug 15, 2019, Washington DC
- 2018 Red Raider minisymposium, Current trends in numerical analysis and scientific computing, Lubbock, TX, Oct 27. 2018
- 2018 AFOSR, Computational Mathematics Program Review Meeting, Aug 13-Aug 17, 2018, Washington DC
- 2018 Banff Workshop, Numerical Analysis of Coupled and Multi-Physics Problems with Dynamic Interfaces, July 29-Aug 3, 2018, Oaxaca, Mexico



- 2017 Numerical Advances on Wave Propagation in Shallow Waters, December 11-13, 2017, Montpellier, France
- 2017 Workshop on Applied and Computational Mathematics honoring Roland Glowinski on the occasion of his 80th anniversary, March 8th, 2017, University of Houston, TX
- 2017 AFOSR, Computational Mathematics Program Review Meeting, August 14-18 2017, Washington DC
- 2017 Conference on Classical and Geophysical Fluid Dynamics: Modeling, Reduction and Simulation, June 26-28, 2017, Virginia Tech, VA
- 2016 Recent developments, analysis and applications, October 03-07, 2016, Institut Henri Poincaré, Paris, France
- 2016 AFOSR, Computational Mathematics Program Review Meeting, August 8-12 2016, Washington DC
- 2016 Singular days, June 27-30, Nancy, France
- 2016 ERDC Fluid-Structure Interaction R&D Workshop, April 14-15, 2016, Vicksburg, MS
- 2016 International workshop on applied and computational mathematics, Honoring Prof. O. Pironneau, Feb 26-27, 2016, University of Houston, TX
- 2015 Oberwolfach Workshop, Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws, Sept 13-15, 2015, Oberwolfach, Germany
- 2015 AFOSR, Computational Mathematics Program Review Meeting, August 3-6 2015, Washington DC
- 2015 Banff Workshop, Higher Order Numerical Methods for Evolutionary PDEs: Applied Mathematics Meets Astrophysical Applications, May 10-15, 2015, Banff, Canada
- 2015 HONOM 2015, European Workshop on High Order Nonlinear Numerical Methods for Evolutionary PDEs: Theory and Applications, March 16-20, 2015, Trento, Italy
- 2015 CIG Geodynamo Benchmarking Workshop, Feb 5-6 2015, Boulder, CO
- 2014 AFOSR, Computational Mathematics Program Review Meeting, July 28-Aug 1, 2014, Washington DC
- 2014 BAIL 2014, Boundary and Interior Layers, Computational & Asymptotic Methods, 15-19 September 2014
- 2014 Sino-French Conference on Computational and Applied Mathematics, June 2-6 2014, Xiamen University, China
- 2014 Mathematical Hydrodynamics 2014, June 16-20, Ecole normale supérieure, Paris, France
- 2013 AFOSR, Computational Mathematics Program Review Meeting, July 29-Aug 1, 2013, Washington DC
- 2013 Lectures Series in Computational Fluid Dynamics, April, Paris-Est University, Paris, France
- 2013 Inaugural Conference, April 16, Ecole des Ponts et Chaussées, Paris, France
- 2013 HONOM 2013, "European Workshop on High Order Nonlinear Numerical Methods for Evolutionary PDEs", March 18-22, Bordeaux
- 2013 SIAM conference on Computational Science and Engineering, Feb 25, March 1, Minisymposium on "Numerical Methods for Transport", Boston, MA
- 2012 CIG Geodynamo Developer Meeting, October 8-10, 2012, Boulder, CO
- 2012 AFOSR, Computational Mathematics Program Review Meeting, July 30-Aug 2, 2012, Washington DC
- 2012 CEMRACS summer school, Jul6 16-20, CIRM, Marseille, France
- 2012 14th International Conference on Hyperbolic Problems, June 25-29, 2012, Padova, Italy
- 2012 Barret Lecture 2012, May 9-11, Knoxville, TN

- 2012 25th CEA-GAMNI annual seminar on "Mecanique des Fluides Numerique", 30-31 January 2012, Paris, France
- 2011 ICIAM, (1) DG Approximation of the Radiative Transfer Equations, (2) Direction Splitting for the Incompressible Navier-Stokes Equations, July 18-22, 2011, Vancouver, BC, Canada
- 2011 May 23-27, SMAI 2011, Workshop on "Méthodes numériques pour les écoulements compressibles et faiblement compressibles", Guidel, France
- 2011 SIAM conference on Computational Science and Engineering, Feb 28, March 4, Workshop on "Advanced Discretization Techniques for Lagrangian Hydrodynamics", Reno, NE
- 2010 Numerical Methods and Applications NM&A'10, August 20-24, 2010, Borovets, Bulgaria
- 2010 Workshop Sparsity and Computation, June 7-11, 2010, Bonn, Germany
- 2009 Workshop on Quality and Reliability of Large Eddy Simulations II, Sept 9-11 2009
- 2009 Lecture Series, 11th French Spring School in Computational Fluid Dynamics, June 7-13 2009 Oléron, France,
- 2009 CIRM, Feb 9-13, Approximation methods for Navier-stokes equations. Winter school "New trends in scientific computing", Marseille, france
- 2007 On the construction of suitable weak solutions of the Navier-Stokes equations, 1030th AMS meeting, Chicago, USA, October 5-6
- 2007 FEF 2007, 14th International Conference on Finite Elements in Flow Problems, March 26-28, 2007, Santa Fe, Keynote speaker (Least-Squares Methods)
- 2007 FEF 2007, 14th International Conference on Finite Elements in Flow Problems, March 26-28, 2007, Santa Fe, Keynote speaker
- 2006 Fifth International Conference on Scientific Computing and Applications. Banff, Canada, May 18 May 22
- 2006 Mathematical and Geophysical Fluid Dynamics: Analytical and Stochastic Methods (AMI), February 13-17 2006
- 2005 Institute for Mathematics and its Applications (IMA), Workshop: "New Paradigms in Computation", March 28-30
- 2003 Oberwolfach workshop on Mathematical Aspects of Computational Fluid Dynamics, November 9-15, 2003, Oberwolfach, Germany
- 2004 Institute of Mathematical Sciences (IMS) at Singapore. Workshop: "Development of Navier-Stokes Equations and Turbulence Research", from 13 Dec 2004 to 16 Dec 2004
- 2003 Oberwolfach workshop on Mathematical Aspects of Computational Fluid Dynamics, November 9-15, 2003, Oberwolfach, Germany
- 2002 Lecture Series, Fourth Annual PIMS Fluid Dynamics Summer School organized by the Pacific Institute for the mathematical Sciences, July 28, August 9, 2002, Edmonton, Canada
- 2001 Euromech/ERCOTAC Colloquium on Spectral methods and time stepping schemes for incompressible flows in complex geometries October 18-19, 2001, Toulouse, France
- 2000 Lecture Series on "finite element approximation of transport equations " Institut Sino-Français des Mathématiques Appliquées, 19-26 Aout 2000, Hangzhou, Chine
- 2000 ISFMA, Symposium on Environmental Science and Engineering with related Mathematical Problems, 19-26 August 2000, Hangzhou, China
- 1999 Symposium on Incompressible Fluid Flows: Numerical Methods and Applications, April 12-14, 1999, Los Alamos, USA
- 1998 Minisymposium on new methods Computational Fluid Dynamics, Annual GAMM Conference, GAMM98, April 1998, Bremen, Germany
- 1995 Lecture Series, 4th French Spring School in Computational Fluid Dynamics, May 1997, Lalonde les Maures, France

1993 Lecture Series, 3rd French Spring School in Computational Fluid Dynamics, May 1993, Carcan-Maubuisson, France

[Invited speaker at colloquiums and seminars](#)

2023 Seminar, Georgia Tech CSE, GA, Oct 6, 2023

2023 Seminar, Center for Nonlinear Studies, LANL, NM, July 13th, 2023.

2022 Joint Applied Math/Inverse Problems Seminar, at Colorado State University, Department of Mathematics, Fort Collins, Colorado, November 17th, 2022.

2022 Department of Mathematics Colloquium, Ohio State University, Columbus, OH, Nov 3, 2022.

2022 Numerical Analysis seminar, TAMU, College Station, TX, October 26, 2022.

2022 Colloquium, Department of Mathematics and Statistics, Texas Tech University, (Virtual), Lubbock, TX, October 12, 2022.

2022 Seminaire d'analyse numerique, CEA DAM Ile de France, Bruyères le Châtel, June 7th, 2022

2022 SERENA Seminar, INRIA, Paris, FR, June 13th, 2022

2022 Numerical Analysis and Scientific Computing seminar, University of Waterloo, Canada, March 8th, 2022, (zoom)

2022 Oden Institute Seminar, Austin, TX, Feb 1, 2022.

2021 Center for Computational & Applied Mathematics Seminar, Purdue, Nov 1, 2021 (zoom)

2021 Department of Mathematics Colloquium, TAMU, College Station, Oct 28, 2021

2021 Seminar series on Structure Preserving Methods for Hyperbolic Equations, Feb 26, 2021 (zoom)

2020 WholeSun Project seminar, March 12, 2020, Orsay, France

2020 Colloquium INRIA, March 5, 2020, Paris, France

2020 Applied & Computational Mathematics seminar, Portland State, Feb 3, 2020, Portland, OR

... Information lost between 2017 and 2020

2016 Seminar d'Analyse Numérique, CIM, 12 Décembre 2016, Marseille, France

2016 Seminar LIMSI-FAST, 24 Novembre 2016, Orsay, France

2016 Seminar du Laboratoire Jacques-Louis Lions UPMC, 04 Nov 2016, Paris, France

2016 Seminar, ICES, Feb 4th 2016, University of Texas, Austin

2015 CEE Seminar, April 22 2015, Duke University

2014 Seminar, Applied Analysis, June 24 2014, IM Marseille, France

2014 Séminaire de Mécanique d'Orsay, June 14 2014, LIMSI, Orsay, France

2013 Seminar, Dept of Aero., September 19th 2013, University of Texas, Austin

2013 Seminar, ICES, September 19th 2013, University of Texas, Austin

2012 Seminar, Oct 23, Institute for Computational Engineering and Science, Austin, TX

2012 Seminar, June 14, Laboratoire Dieudonné, Nice, FR

2012 Annual colloquium IAMCS, May 6-7, KAUST, Saudi Arabia

2011 Seminar, May 16, CERMICS, ENPC, Marnes la Vallée, FR

2011 Seminar, April 28, Laboratoire Dieudonné, Nice, FR

2011 Seminar, March 7, Lawrence Livermore National Lab, Livermore, CA

2010 November 12, Applied Mathematics Seminar, Brown, RI

2010 School on Coupled PDE in Multiphysics and Industrial Applications, June 14-25, Castro Urdiales, Spain

2010 April 26, Rencontre de Mecanique des Fluides, Nice, France

2010 April 19, Seminar, CEMEF, Nice, France

2009 Dec 10, Seminar, SANDIA National Lab, Albuquerque, NM

2009 June 25, Seminar, LIMSI, Orsay, FR

- 2009 May 15, Seminar, EXXON Mobile, Houston, TX
- 2009 April 23, Seminar of Numerical Analysis, Nice FR
- 2009 Seminar, March 23, Lawrence Livermore National Lab, Ca
- 2009 Seminar of Mathematics, University of Texas at San Antonio, TX, Jan 30, 2009
- 2008 Computational and Applied Mathematics Colloquium, Penn State University, University Park, Pa, October 24, 2008
- 2008 Seminar of Analysis, University of Texas at Austin, Austin, TX, October 1, 2008
- 2008 Seminar in computational mechanics, LIMSI, Orsay, France, Jun 12,2008
- 2007 Numerical Analysis Seminar, University of Maryland, College Park, MD, November 6, 2007
- 2007 Colloquium, SANDIA National Lab, Albuquerque, March 29, 2007
- 2006 Colloquium, Tulane Univ., April 6, 2006
- 2006 Seminar of Numerical Analysis, Tulane Univ., April 5, 2006
- 2006 Seminar of Graduate Students, Texas A&M, March 23, 2006
- 2006 Seminar, LIMSI Wednesday 14 june, 2006
- 2005 Scientific Computing Seminar, University of Houston, November 10, 2005
- 2005 Mathematics Colloquium, Univ. Pittsburgh, February 25, 2005
- 2005 Seminar of Numerical Analysis, Univ. Pittsburgh, February 25, 2005
- 2005 Seminar of Numerical Analysis, Univ. Texas A&M, January 26, 2005
- 2004 Seminar of Numerical Analysis, Univ. Texas A&M, November 10, 2004
- 2004 Seminar of Numerical Analysis, Univ. Texas A&M, January 28, (2004)
- 2004 Seminar of Numerical Analysis, Univ. Purdue, Indiana, January, (2004)
- 2003 Séminaire d'Analyse Numérique, Math. dept., Univ. Bordeaux
- 2003 Séminaire du CERMICS, Ecole des Ponts et Chaussées, Paris
- 2003 Séminaire Méthodes Numériques, Paris VI, Paris
- 2003 Séminaire d'Analyse Numérique, Math. dept., Univ. Paris XI, Orsay
- 2003 Séminaire de Mathématiques, Math. dept., Univ. Nice
- 2003 Seminar of Mechanics at LIMSI, Paris XI, Orsay
- 2002 Mathematical Physics seminar, Math. dept., UT, Austin, TX
- 2002 TICAM seminar, Austin, TX
- 2002 Séminaire de Mathématiques, Univ, Sherbrook, Canada
- 2001 TICAM seminar, Austin, TX
- 2001 Séminaire de l'équipe Equations aux Dérivées Partielles du Laboratoire de Modélisation de Calcul, Grenoble, France
- 2001 13ème Séminaire CEA, Mécanique des Fluides Numérique, Orsay, France
- 2000 Séminaire du Laboratoire SINUMEF, ENSAM, Paris, France
- 1998 Séminaire du Laboratoire d'Analyse Numerique de Paris XI
- 1998 Séminaire d'analyse numerique (math. appli.) de l'IRMAR, Rennes, France
- 1998 Séminaire de Calcul Scientifique de l'UFR des Sciences et des Techniques de Besançon, France
- 1996 Colloquium de Mathématiques Appliquées, Ecole Polytechnique, Palaiseau, France
- 1996 Séminaire de Mécanique de l'UFR de Mathématiques de Caen, France
- 1995 Séminaire de Mathématiques Appliquées, Ecole Polytechnique
- 1994 Séminaire d'Analyse non Linéaire, Paris XI, Paris, France
- 1994 Séminaire de Mécanique, Paris VI, Paris, France
- 1991 Séminaire de Mécanique, Paris VI, Paris, France

[Contributed conference talks](#)

2024 WONAPDE 2024, Concepcion, Chile, January 15-19, 2024  
2023 6th Annual Meeting of the SIAM Texas-Louisiana Section, Lafayette, LA, Nov. 3-5, 2022.  
2023 USACM Conference, Albuquerque, NM, July 24-27, 2023  
2023 FE Rodeo, TAMU, College Station, TX, March 24 - 25, 2023  
2022 5th Annual Meeting of the SIAM Texas-Louisiana Section, Houston, TX, Nov. 4-6, 2022.  
2022 AMS 2022 Fall Central Sectional Meeting University of Texas at El Paso, El Paso, TX, September 17-18, 2022  
2022 AMS Spring Central Virtual Sectional Meeting, March 26-27, 2022.  
2021 4th Annual Meeting of the SIAM Texas-Louisiana Section, Nov. 5-7, 2021, South Padre Island  
2021 SIAM CSE 2021, March 1-5, Dallas, TX (zoom)  
2020 3rd Annual Meeting of the SIAM Texas-Louisiana Section October 16-18, TAMU, College Station, TX (zoom)  
2019 NAHOMCon 19, June 2-5, San Diego, CA  
2019 MultiMat 2019 (9th International Conference on Numerical Methods for Multi-Material Fluid Flows), 9 to 13 September Trento, Italy  
2019 SIAM CSE 2019, Feb 25- March 1, Spokane, WA  
2018 International Conference on Spectral and High Order methods, July 9-13, London, UK  
2018 XVII International Conference on Hyperbolic Problems Theory, Numerics, Applications June 25-29, University Park, PA  
2018 FE Rodeo & Circus, LSU, Baton Rouge, LA, Feb 23-24  
2017 SIAM CSE 2017, Feb 27- March 3, Atlanta, GA  
2017 MultiMat 2017, September 18-22, Santa Fe, NM  
2016 MAFELAP 2016, June 13-17, Brunel University, London, UK  
2016 WONAPDE, 2016, Universidad de Concepción Concepción, Chile January 11-15  
2015 FE Rodeo, SMU, Dallas, TX, Feb 27-28  
2013 FE Rodeo & Circus, LSU, Baton Rouge, LA, March 8-9  
2011 The 2011 Finite Element Rodeo, February 25-26, Texas A&M University  
2009 ENUMATH 2009, Uppsala University, Sweden, June 29-July 3  
2007 AMS meeting #1030, Chicago, USA, October 5-6  
2007 113th Annual Meeting of the American Mathematical Society (AMS), New-Orleans, January 5-8  
2007 14th International Conference on Finite Elements in Flow Problems, March 26-28, Santa Fe, USA  
2006 Eighth IMACS Conference on Iterative Methods, November 15-17, College Station, TX  
2006 The 2006 Finite Element Rodeo, March 3-4, Texas A&M University  
2006 29th Annual Texas Partial Differential Equations Conference, Saturday and Sunday, March 25-26, University of Texas at Arlington  
2005 58th Annual Meeting of the Division of Fluid Dynamics of the APS, Sunday–Tuesday, November 20–22, Chicago, IL  
2005 CFM 2005, XVII Congrès Français de Mécanique, Aug. 29 - Sept. 2, Troyes, France  
2005 Eight U.S. National Congress on Computational Mechanics, 24-28 July (2005), Austin, TX  
2005 ENUMATH2005, 18-22 July, Santiago De Compostela, Spain  
2004 ECCOMAS 2004, Jyväskylä, Finland on 24-28 July  
2002 CM2002-Beijing, Satellite Conference of Scientific Computing, Aug. 15-18, Xian, China

- 2001 American Physical Society, 54th Annual Meeting of the Division of Fluid Dynamics November 18-20, San Diego, California
- 2000 International Conference on Finite Element in Fluids, May, Austin, TX
- 2000 Applied Mathematics for Industrial Flows, Second International Conference, 12-14 October, Il Ciocco, Tuscany, Italy
- 1999 Journée scientifiques de l'ANDRA, Nancy, 7-9 December
- 1999 IUTAM, Symposium on Theoretical and Numerical Methods in Continuum Mechanics of Porous Media, Stuttgart, Germany, September 5-10
- 1998 GAMM98, April, Bremen, Germany
- 1998 AMIF, October 1998, San feliu de Guixols, Spain
- 1995 Congrès International la Modélisation Mathématique des Écoulements en Milieux Poreux, May, St-Etienne, France
- 1992 XXIVeme Congrès National d'Analyse Numérique, Vittel, France
- 1986 Colloque d'automne ATMA, Paris, 1986

## INVITED POSITIONS

- 2023 July 5, Aug 11 2023 (1 month), LANL Fellow, Los Alamos National Laboratory, NM
- 2023 May 30, June 30 2023 (1 month), INRIA International Chair, INRIA, Paris, France
- 2023 January 8, March 10 2023 (2 months), INRIA International Chair, INRIA, Paris, France
- 2022 June 24, July 23 2022 (1 month), University of Paris-Saclay, France
- 2022 May 16 - June 24 2022 (1 month), INRIA International Chair, INRIA, Paris, France
- 2022 Feb 14 - March 16 2022 (1 month), INRIA International Chair, INRIA, Paris, France
- 2020 March 2019 (1 month), INRIA International Chair, INRIA, Paris, France
- 2019 July 15 to August 15/2019 (1 month) Invited professor, University Paris XI, France
- 2019 June 8 to July 15/2019 (1 month), INRIA International Chair, INRIA, Paris, France
- 2018 12/2018 (1/2 month), Invited professor, INRIA, Paris, France
- 2018 05-06/2018 (1.5 month), Invited professor, INRIA, Paris, France
- 2017 12/2016-01/2017 (1/2 month), CERMICS, ENPC, France
- 2016 10-11/2016 (3 months), Invited professor, Institut Henri Poincaré, Paris
- 2016 09/2016 (1 month), Invited professor, University Paris XI, France
- 2015 06-07/2015 (1 month), Invited professor, University Paris XI, France
- 2015 05-06/2015 (1 month), CERMICS, ENPC, France
- 2015 05-06/2015 (1 month), CERMICS, ENPC, France
- 2015 01/2015 (3 weeks) Invited professor, University Paris XI, France
- 2014 07/2014 (1 month) Invited professor, Aix-Marseille University, France
- 2014 01, 05/2014 (2 months) Invited professor, University Paris XI, France
- 2013 04-05/2013 (2 months) Invited professor, University Paris Est, France
- 2013 01-02/2013 (1 month) Invited professor, University Paris XI, France
- 2013 01-02/2013 (1 month) Invited professor, University Paris XI, France
- 2012 20-24/08/2012 (1 week), CERMICS, ENPC, France
- 2012 05-06/2012 (1 month), Invited professor, University Nice, France
- 2012 06-07/2012 (1 month) Invited professor, University Paris XI, France
- 2011 05/2011 (1 month), Invited professor, Ecole Nationale des Ponts et Chaussées, Marnes La vallée, France
- 2011 04/2011 (1 month), Invited professor, University Nice, France

2011 01-02/2011 (1 month), Invited professor, University Paris XI, France  
2010 04/2010 (1 month), Invited professor, University Nice, France  
2010 01-02/2010 (1 month), Invited professor, University Paris XI, France  
2009 06/2009 (1 month), Invited professor, University Paris XI, France  
2004 04/2009 (1 month), Invited professor, Nice University, France  
2006 06/2008 (1 month), Invited professor, University Paris XI, France  
2006 06/2006 (1 month), Invited professor, University Paris XI, France  
2005 07/2005 (2 weeks), Invited professor, Ecole Nationale des Ponts et Chaussées, France  
2004 01/2004 to 02/2004 (1 month), Invited professor at the University of Purdue, IN  
2003 08/2002 to 07/2003 (11 months), TICAM fellowship, Austin, TX  
2002 08/2002 (1 month) Invited professor at the University of Edmonton, Canada  
2001 08/2001 to 07/2001, (11 months) TICAM fellowship, Austin, TX

## PUBLICATIONS

### Books

1. A. ERN AND J.-L. GUERMOND, Finite Elements I, Approximation and interpolation, Texts in Applied Mathematics, Vol. **72** (2021) 313 p., Springer-Verlag, New York.
2. A. ERN AND J.-L. GUERMOND, Finite Elements II, Galerkin approximation, elliptic and mixed PDEs, Texts in Applied Mathematics, Vol. **73** (2021) 474 p., Springer-Verlag, New York.
3. A. ERN AND J.-L. GUERMOND, Finite Elements III, First-Order and Time-Dependent PDEs, Texts in Applied Mathematics Springer, Vol. **74** (2021) 405 p., Springer-Verlag, New York.
4. A. ERN AND J.-L. GUERMOND, Finite Elements IV, Exercises and solutions, 472 p., <https://hal.science/hal-03226052>
5. A. ERN AND J.-L. GUERMOND, *Theory and Practice of Finite Elements*, Springer Series in Applied Mathematical Sciences, Vol. **159** (2004) 530 p., Springer-Verlag, New York.
6. A. ERN, J.-L. GUERMOND, *Éléments Finis*, Springer Series in *Mathématiques & Applications* Vol. **36** (2002) 360 p., SMAI/Springer-Verlag, Paris.

### Articles in refereed journals

1. M. CREFF, H. FALLER, B. DUBRULLE, J.-L. GUERMOND, C. NORE Tracking dynamo mechanisms from local energy transfers: Application to the von Kármán sodium dynamo, *Physics of Plasmas*, **31**, 022306 (2024),
2. J.-L. GUERMOND, M. NAZAROV, B. POPOV Finite element-based invariant-domain preserving approximation of hyperbolic systems: Beyond second-order accuracy in space. *Computer Methods in Appl. Math. and Engin.*, Volume 418, Part A, 1 January 2024, 116470
3. A. ERN, J.-L. GUERMOND The discontinuous Galerkin approximation of the grad-div and curl-curl operators in first-order form is involution-preserving and spectrally correct *SIAM SINUM*, **61** 6 (2023) 2940–2966.
4. A. ERN, J.-L. GUERMOND Invariant-domain-preserving high-order time stepping: II. IMEX schemes, *SIAM SISC*, **45**, 5, (2023) A2511-A2538.
5. B. CLAYTON, J.-L. GUERMOND, M. MAIER, B. POPOV, E.J. TOVAR, Robust second-order approximation of the compressible Euler equations with an arbitrary equation of state *Journal of Computational Physics* **478**, 1 April (2023) 111926.
6. Z DONG, A. ERN, J.-L. GUERMOND Local decay rates of best-approximation errors using vector-valued finite elements for fields with low regularity and integrable curl or divergence *Comptes Rendus. Mathématique* **361** (G4), (2023) 723-736.
7. JEAN-LUC GUERMOND, BOJAN POPOV, LAURA SAAVEDRA Second-order invariant domain preserving ALE approximation of Euler equations, *Communications on Applied Mathematics and Computation* **5** (2), (2023) 923–945
8. A. ERN, J.-L. GUERMOND Invariant-domain-preserving high-order time stepping: I. Explicit Runge–Kutta schemes, *SIAM SISC*, **44**, No. 5, (2022) A3366–A3392.
9. B. CLAYTON, J.-L. GUERMOND, B. POPOV, Invariant-domain preserving approximations for the Euler equations with tabulated equation of state, *SIAM SISC*, **44** (2022), no. 1, A444–A470.
10. J.-L. GUERMOND, C. KEES, B. POPOV, E. TOVAR Well-balanced second-order convex limiting technique for solving the Serre equations, *Water Waves*, **4**, (2022) 409–445.
11. J.-L. GUERMOND, C. KEES, B. POPOV, E. TOVAR Hyperbolic relaxation technique for solving the dispersive Serre–Green–Naghdi equations with topography, *J. Comput. Phys.* **450** (2022) 110809.
12. JEAN-LUC GUERMOND, MARTIN KRONBICHLER, MATTHIAS MAIER, BOJAN POPOV, IGNACIO TOMAS On the implementation of a robust and efficient finite element-based parallel solver for the compressible Navier–Stokes equations, *Comput. Methods. Appl. Mech. Engrg.* **389** (2022) 114250.
13. ALEXANDRE ERN, JEAN-LUC GUERMOND, Quasi-optimal nonconforming approximation of elliptic PDEs with contrasted coefficients and minimal regularity, *Foundations of computational mathematics*, **22**, pages 1273–1308 (2022).
14. R. ZANELLA; C. NORE; X. MININGER; F. BOUILLAULT J.-L. GUERMOND, Numerical Study of Cooling by Ferrofluids in an Electrical Transformer using an Axisymmetric Model, *IEEE Transactions on Magnetics*, (2021) 10.1109/TMAG.2021.3066412
15. C. NORE, L. CAPPANERA, J.-L. GUERMOND, T. WEIER, AND W. HERREMAN Feasibility of Metal Pad Roll Instability Experiments at Room Temperature, *Phys. Rev. Lett.* **126**, 184501, Published 7 May (2021)
16. W. HERREMAN, C. NORE, L. CAPPANERA, AND J.-L. GUERMOND, Efficient mixing by the swirled



- electrovortex flow in liquid metal batteries, *J. Fluid Mech.*, **915** (2021) A17.
17. H. FALLER, D. GENESTE, T. CHAABO, A. CHEMINET, V. VALORI, Y. OSTOVAN, L. CAPPANERA, CH. CUVIER, F. DAVIAUD 1 , J.-M. FOUCAUT, J.-L. GUERMOND, J.-PH. LAVAL, C. NORE, V. PADILLA, C. WIERTEL, B. DUBRULLE, On the nature of intermittency in a turbulent von Kármán flow, *J. Fluid Mech.*, **914** (2021) A2.
  18. J.-L. GUERMOND, M. MAIER, B. POPOV, I. TOMAS, Second-order invariant domain preserving approximation of the compressible Navier-Stokes equations, *Comput. Methods Applied Mech. Engin.*, **375** (2021) 113608.
  19. L. CAPPANERA, P. DEBUE, H. FALLER, D. KUZZAY, E.-W. SHAW, C. NORE, J.-L. GUERMOND, F. DAVIAU, D, C. WIERTEL-GASQUET, B. DUBRULLE, Turbulence in realistic geometries with moving boundaries: when simulations meet experiments, *Computers and Fluids*, **214**, 10475 (2021).
  20. W. HERREMAN, S. BENARD, C. NORE, P. PERSONNETAZ, L. CAPPANERA, J.-L. GUERMOND, Solutal buoyancy and electrovortex flow in liquid metal batteries, *Phys. Rev. Fluids*, **5**, (2020) 074501.
  21. JEAN-LUC GUERMOND, BOJAN POPOV, JEAN RAGUSA, Positive and Asymptotic Preserving Approximation of the Radiation Transport Equation, *SIAM J. Numer. Anal.*, **58** 1, (2020) 519–540.
  22. SLEIMANE NASSER EL DINE, XAVIER MININGER, CAROLINE NORE, RAPHAËL ZANELLA, FRÉDÉRIC BOUILLAULT, JEAN-LUC GUERMOND Impact of Magnets on Ferrofluid Cooling Process: Experimental and Numerical Approaches *IEEE Transactions on Magnetics*, **56** 1 (2020) 7502404.
  23. JEAN-LUC GUERMOND, BOJAN POPOV, LAURA SAAVEDRA Second-order invariant domain preserving ALE approximation of hyperbolic systems, *J. Comput. Phys.* **401**, (2020), 108927.
  24. W. HERREMAN, C. NORE, P. ZIEBELL RAMOS, L. CAPPANERA, J.-L. GUERMOND, AND N. WEBER Numerical simulation of electrovortex flows in cylindrical fluid layers and liquid metal batteries, *Phys. Rev. Fluids*, **4** (2019) 113702.
  25. J.-L. GUERMOND, B. POPOV, E. TOVAR, C. KEES, Robust explicit relaxation technique for solving the Green-Naghdi equations, *J. Comput. Phys.* **339** (2019), 108917.
  26. W. HERREMAN, C. NORE, J.-L. GUERMOND, L. CAPPANERA, N. WEBER, G. M. HORSTMANN, Perturbation theory for metal pad roll instability in cylindrical reduction cells, *J. Fluid Mech.*, **878** (2019) 598–646.
  27. JEAN-LUC GUERMOND, CHRISTIAN KLINGENBERG, BOJAN POPOV AND IGNACIO TOMAS, The Suliciu approximate Riemann solver is not invariant domain preserving, *Journal of Hyperbolic Differential Equations*, **16:01** (2019) 59–72.
  28. JEAN-LUC GUERMOND, PETER MINEV, High-order adaptive time stepping scheme for the Incompressible Navier-Stokes Equations, *SIAM J. Sci. Comput.*, **412** (2019) A770-788.
  29. JEAN-LUC GUERMOND, BOJAN POPOV, LAURA SAAVEDRA, YONG YANG Arbitrary Lagrangian-Eulerian Finite Element Method Preserving Convex Invariants of Hyperbolic Systems, in *Contributions to Partial Differential Equations and Applications*, Chetverushkin, B. N., Fitzgibbon, W., Kuznetsov, Y.A., Neittaanmäki, P., Periaux, J., Pironneau, O., Eds., Springer International Publishing, (2019) 251–272.
  30. J.-L. GUERMOND, BOJAN POPOV, IGNACIO TOMAS Invariant domain preserving discretization-independent schemes and convex limiting for hyperbolic systems, *Computer Methods in Appl. Math. and Engin.*, **347** (2019) 143–175.
  31. J.-L. GUERMOND, M. QUEZADA DE LUNA, B. POPOV, C. KEES, M. FARTHING, Well-balanced second-order finite element approximation of the shallow water equations with friction. *SIAM J. Sci. Comput.*, **40:6** (2018) A3873—A3901.
  32. JEAN-LUC GUERMOND, MURTAZO NAZAROV, BOJAN POPOV, IGNACIO TOMAS, Second-order invariant domain preserving approximation of the Euler equations using convex limiting *SIAM J. Sci. Comput.*, **405** (2018) A3211–A3239.
  33. C. NORE, D. CASTANON QUIROZ, L. CAPPANERA AND J.-L. GUERMOND, Numerical simulation of the Von-Kármán-Sodium dynamo experiment, *J. Fluid Mech.*, **854** (2018) 10 November 2018, pp. 164-195.
  34. RAPHAËL ZANELLA, CAROLINE NORE, FRÉDÉRIC BOUILLAULT, JEAN-LUC GUERMOND, XAVIER MININGER, Influence of thermomagnetic convection and ferrofluid thermophysical properties on heat transfers in a cylindrical container heated by a solenoid, *Journal of Magnetism and Magnetic Materials*, **429** (2018) 52–63.
  35. A. ERN, J.-L. GUERMOND, Analysis of the edge finite element approximation of the Maxwell equations with low regularity solutions, *Computers and Mathematics with Applications*, **753**, (2018) 918-932.

36. L. CAPPANERA, J.-L. GUERMOND, W. HERREMAN, C. NORE, Momentum-based approximation of incompressible multiphase fluid flows, *Int. J. Numer. Fluids*, (2018) **86**:541–563, DOI: 10.1002/flid.4467.
37. RAPHAEL ZANELLA, CAROLINE NORE, FREDERIC BOUILLAUT, LOIC CAPPANERA, IGNACIO TOMAS, XAVIER MINIGER, AND JEAN-LUC GUERMOND, Study of Magnetoconvection Impact on a Coil Cooling by Ferrofluid with a Spectral/Finite-Element Method, *IEEE Transactions on Magnetics*, **54**:3 (2018) 4600104.
38. J.-L. GUERMOND, B. POPOV Invariant domains and second-order continuous finite element approximation for scalar conservation equations, *SIAM J. Numer. Anal.* **55**:6 (2017) 3120–3146.
39. P. AZERAD, J.-L. GUERMOND, B. POPOV Well-balanced second-order approximation of the shallow water equation with continuous finite elements, *SIAM J. Numer. Anal.* **55**:6 (2017) 3203–3224.
40. A. ERN, J.-L. GUERMOND, Finite element quasi-interpolation and best approximation, *Math. Mod. Numer. Anal., M2AN*, **51** (2017) 1367–1385.
41. A. ERN, J.-L. GUERMOND, Abstract Nonconforming Error Estimates and Application to Boundary Penalty Methods for Diffusion Equations and Time-Harmonic Maxwell's Equations, *Comput. Methods Appl. Math.*, <https://doi.org/10.1515/cmam-2017-0058>, (2017) 1–25.
42. J.-L. GUERMOND, M. QUEZADA DE LUNA, T. THOMPSON, A conservative anti-diffusion technique for the level set method, *J. Comput. Appl. Math.*, **321** (2017) 448–468.
43. JEAN-LUC GUERMOND, BOJAN POPOV, LAURA SAAVEDRA, YONG YANG Invariant domains preserving Arbitrary Lagrangian Eulerian approximation of hyperbolic systems with continuous finite elements, *SIAM J. Sci. Comput.* **39** No 2 (2017) A385–A414.
44. JEAN-LUC GUERMOND, BOJAN POPOV, YONG YANG The effect of the consistent mass matrix on the maximum-principle for scalar conservation equations, *J. Sci. Comput.* **70** 3 (2017) 1358–1366.
45. J.-L. GUERMOND, P. MINEV, High-order time stepping for the Navier-Stokes equations with minimal computational complexity, *Journal of Computational and Applied Mathematics*, **310**, (2017), 92–103
46. A. ERN, J.-L. GUERMOND, A converse to Fortin's Lemma in Banach spaces, *C. R. Acad. Sci. Paris*, **354** 11 (2016), 1092–1095.
47. A. ERN, J.-L. GUERMOND, Chapter 11 - Linear Stabilization for First-Order PDEs, *Handbook of Numerical Methods for Hyperbolic Problems: Basic and Fundamental Issues*, Rémi Abgrall and Chi-Wang Shu, Editors, Elsevier **17** (2016) 265–288.
48. J.-L. GUERMOND, B. POPOV, Fast estimation of the maximum wave speed in the Riemann problem for the Euler equations. *J. Comput. Phys.*, **321** (2016) 908–926.
49. J.-L. GUERMOND, B. POPOV, Invariant domains and first-order continuous finite element approximation for hyperbolic systems, *SIAM J. Numer. Anal.*, **54** 4 (2016) 2466–2489.
50. C. NORE, D. CASTANON QUIROZ, L. CAPPANERA, AND J.-L. GUERMOND Direct numerical simulation of the axial dipolar dynamo in the Von-Kármán-Sodium experiment, *Euro. Phys. Letters* **114** 6 (2016) 65002.
51. L. CAPPANERA, J.-L. GUERMOND, J. LÉORAT, C. NORE, Two spinning ways for precession dynamo, *Phys. Rev E.*, **93**, 043113 (2016).
52. HIROAKI MATSUI, ET AL. Performance benchmarks for a next generation numerical dynamo model, *Geochemistry, Geophysics, Geosystems*, Volume 17, Issue 5 May 2016, Pages 1586–1607.
53. A. ERN, J.-L. GUERMOND, Mollification in strongly Lipschitz domains with application to continuous and discrete De Rham complex, *Computational Methods in Applied Mathematics*, Volume 16, Issue 1, (2016) 51–75.
54. A. BONITO, J.-L. GUERMOND, F. LUDDENS, An Interior Penalty Method with  $C^0$  Finite Elements for the Approximation of the Maxwell Equations in Heterogeneous Media: Convergence Analysis with Minimal Regularity, *M2AN* **50** (2016) 1457–1489.
55. J.-L. GUERMOND, B. POPOV Error estimates of a first-order Lagrange finite element technique for nonlinear scalar conservation equations, *SIAM J. Numer. Anal.*, **54**:1 (2016) 57–85.
56. J.-L. GUERMOND, B. POPOV, V. TOMOV, Entropy-viscosity method for the single material Euler equations in Lagrangian frame, **300** (2016) *Computer Methods in Appl. Math. and Engin.*, 402–426.
57. A. BONITO, J.-L. GUERMOND, S. LEE, Simulations of bouncing jets, *Int. J. Numer. Methods Fluids* **80** (2016) 53–75.
58. HOUDA ZAIDI, FREDERIC BOUILLAUT, CAROLINE NORE, ALAIN BOSSAVIT, JEAN-LUC GUERMOND Approximation of the time-dependent induction equation with advection using Whitney elements: application to dynamo action, *COMPEL - The international journal for computation and mathematics in electrical and electronic engineering* **35**:1, (2016) 326–338.

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