Maxime J. P. Theillard

Associate Professor of Applied Mathematics
University of California, Merced

Academic employement

University of California, Merced • Associate Professor, 2023 - present

- School of Natural Science, Applied Mathematics Department

University of California, Merced • Assistant Professor, 2017 - 2023

- School of Natural Science, Applied Mathematics Department

University of California, San Diego • Postdoctoral scholar, 2014 - 2017

- Working with David Saintillan on the numerical modeling of complex fluids

Education

University of California, Santa Barbara • PhD candidate, 2009 - 2014

- Working with Frédéric Gibou on the numerical modeling of interfacial physics problem

University of California, Santa Barbara • Masters of Mechanical Engineering, 2009 - 2010

- Specialization in Computational Science and Engineering

Ecole Polytechnique Palaiseau, France • 2006 - 2010

- Specialization in Applied Mathematics

Awards

NSF award # 2112675: CREST Center for Cellular and Biomolecular Machines

- Senior personnel, $ 5,000,000, August 2021

CITRIS Covid-19 grant

- PI, CITRIS and the Banatao Institute, University of California, $ 20,000, April 2020

NSF award # 1840265: RTG: Data-Intensive Research and Computing at the University of California, Merced

- Senior personnel, $ 2,000,000, May 2019

Academic Senate Faculty Research Grant

- PI, Committee on research, $ 5,000, February 2019

Excellence Fellowship

- Department of Mechanical Engineering at UCSB - June 2012

Dean's Fellowship

- UCSB - May 2012

Grand Prix du Stage de recherche

- Ecole Polytechnique - November 2009

Publications

1. **Stable nodal projection method on octree grids** , M. Blomquist, S. West, A. Binswanger, M. Theillard, (submitted, available on arxiv)
2. **Dissolution and mixing in confined active two-phase systems**, C. Fyling, A. Gopinath, M. Theillard, (in preparation)
3. **Projection method for the fluctuating hydrodynamics equations**, M. Mancini, C. Kim, M. Theillard, (J. Comput. Phys (2022))
4. **Conservative Finite Volume Method on Deforming Geometries: the Case of Protein Aggregation in Dividing Yeast Cells**, A. Heydari, M. Theillard, S. Sindi, J. Comput. Phys (2021)
5. **Computational Modelling of Protein Conformational Changes - Application to the Opening SARS-CoV-2 Spike**, A. Kucherova, S. Strango, S. Sukenik, M. Theillard, J. Comput. Phys (2021)
6. **A Volume-preserving reference-map method for the level-set representation**, M. Theillard, J. Comput. Phys (2021)
7. **Modeling the Opening SARS-CoV-2 Spike: an Investigation of its Dynamic Electro-Geometric Properties**, A. Kucherova, S. Strango, S. Sukenik, M. Theillard, Bioarxiv (2020)
8. **Retention of rising oil droplets in density stratification**, T. Mandel, D. Zhen Zhou, L. Waldrop, M. Theillard, D. Kleckner, S. Khatri, (Physical Reviews Fluids, 2020)
9. **Computational mean-field modeling of confined active fluids**, M.Theillard, D.Saintillan, J. Comput. Phys. (2019)
10. **A sharp projection method for the two phase flows problem on adaptive Quad/Octrees**, M.Theillard, F.Gibou, D.Saintillan, J. Comput. Phys. (2019)
11. **A coupled level-set and reference-map method for interface representation with applications to two-phase flows simulation.** , T. Bellotti, M. Theillard, J. Comput. Phys. (2019)
12. **Level-Set Simulations of Soluble Surfactant Driven Flows**, C.Cleret de Langavant, A.Guittet, M.Theillard, F.Gibou, J. Comput. Phys (2017)
13. **Geometric control of active collective motion**, M.Theillard, R.Alonso, D.Saintillan, Softmatter (2017)
14. **A stable projection method for the incompressible Navier–Stokes equations on arbitrary geometries and adaptive Quad/Octrees**, A.Guittet, M.Theillard F.Gibou, J. Comput. Phys. (2015)
15. **A Sharp Computational Method for the Simulation of the Solidification of Binary Alloys**, M. Theillard, F.Gibou, T.Pollock, J. Scient. Comput. (2015)
16. **A Level-Set Based Approach for Solving the Equations of Linear Elasticity in Irregular Domains Using Adaptive Mesh Refinement on Cartesian Grids**, M.Theillard, L.Fokoua, J-L.Vié, F.Gibou, J. Comput. Phys. (2013)
17. **An Adaptive, Finite Difference Solver for the Nonlinear Poisson-Boltzmann Equation with Applications to Biomolecular Computations** , M.Mirzadeh, M.Theillard, A.Helgadottir, D.Boy, F.Gibou, Com. in Comput. Phys. (2013)
18. **A Multigrid Method on Non-Graded Adaptive Octree and Quadtree Cartesian Grids**, M.Theillard, C.Rycroft, F.Gibou, J. Scient. Comput. (2013)

19. **A second-order discretization of the nonlinear Poisson-Boltzmann equation over irregular geometries using non-graded adaptive Cartesian grids**, M.Mirzadeh, M.Theillard, F.Gibou, J. Comput. Phys. (2011)

Conference Talks

APS annual DFD meeting Phoneix, AZ • November 2021
SMB Annual Meeting Online • Jue 2021
Yosemite Fluids Meeting Wawona, CA • September 2018
AMS Spring Central and Western Joint Sectional Meeting Honolulu, HI • March 2019
Yosemite Fluids Meeting Wawona, CA • September 2018
SIAM Conference on Nonlinear Waves 2018 Anaheim, CA • June 2018
SoCal Flow Physics Symposium San Diego, CA • April 2017
APS annual DFD meeting Portland, OR • November 2016
SIAM annual meeting Boston, MA • July 2016
SIAM Parallel Processing conference Paris, France • April 2016
APS annual DFD meeting Boston, MA • November 2015
APS annual DFD meeting San Francisco, CA • November 2014
CEBA international meeting Genova, Italy • July 2013
SIAM CSE conference Boston, MA • February 2013
SIAM CSE conference Reno, NV • March 2011

Invited Talks

Université Paris Cite Paris • July 2023
Journées Écoulements & Fluides à Saclay Saclay • June 2023
Maison de la simulation Saclay • June 2023
ENS Paris Saclay, Borelli Center Saclay • April 2023
University of Luxembourg, Computational Sciences Dept. Luxembourg • March 2023
Ecole Polytechnique, Center for Applied Mathematics France • March 2023
University of California, Santa Barbara, Mechanical Enngineering • October 2022
University of California Davis, Mathematics • April 2019
French Institute for petroleum • January 2018
Bay Area Scientific Computing Day • December 2017
University of California Merced, Physics • November 2017
University of California Merced, Applied Mathematics • February 2017
New Jersey Institute of Technology, Mechanical Engineering • February 2017
Queen's University, Mathematics Departments Canada • January 2017
Ecole Polytechnique, Center for Applied Mathematics France • January 2017
University of California Santa Barbara, Mechanical Engineering • October 2016
University of Illinois at Urbana-Champaign Mechanical Engineering • March 2016
University of Wisconsin - Madison Mechanical Engineering Departement • February 2016

Reviewer for Archived Journals

Journal of Computational Physics
Journal of Scientific Computing
Physical Review E
Physical Review Fluids
European Journal of Mechanics / B Fluids
SIGGRAPH

Proceedings of the Royal Society A: Mathematical, Physical and Eng. Sciences
Numerical Methods for Partial Differential Equations
Applied Numerical Mathematics
Fuel Processing Technology
MDPI Applied Sciences
MDPI Fluids
MDPI Buildings
Communication in Nonlinear Science and Numerical Simulation
American Mathematical Society
Computer Physics Communications
Journal of Chemical Information and Modeling

Teaching

University of California, Merced - Applied Mathematics Dept. (2017-persent)

- MATH 125 Intermediate Differential Equations (Spring 2019, Fall 2019, Spring 2021, Fall 2021)
- MATH 233 Scientific Computing (Fall 2018, Fall 2020, Fall 2022)
- MATH 132 Numerical Analysis II (Spring 2018, Spring 2020, Spring 2022)

University of California, Santa Barbara - Mechanical Engineering Dept. (2009-2014)
Teaching assistant

- ME 140A Numerical Analysis (Fall 2009)
- ME 17 Mathematics for Engineering (Spring 2010, Spring 2011, Summer 2011, Spring 2012, Spring 2014)
- ME 16 Dynamics (Summer 2011, Spring 2013)
- ME 151A Thermosciences (Fall 2013)

Student Mentoring

- **Current Graduate Students**
  1. **Anna Kucherova**
  2. **Masato Terasaki**, winner of the 2015 French mathematics olympiad (West Africa region)
  3. **Scott West**, Graduate Dean's Recruitment Fellow
  4. **Matt Blomquist**
  5. **Cayce Fylling**
  6. **Adam Binswanger**, co-advised with Shilpa Khatri
  7. **Irabiel Romero**, co-advised with Noemi Petra
  8. **Ali Heydari**, co-mentored with Suzanne Sindi, winner of the best poster award at SIAM CSE 2021
- **Current PhD Committees**
  1. **Tanya Tafolla**, UC Merced, Applied Math

2. **Vallentin Dallerit**, UC Merced, Applied Math
3. **Jared Stewart**, UC Merced, Applied Math
4. **Tri Nguyen**, UC Merced, Applied Math
5. **Matteo Polimeno** , UC Merced, Applied Math
6. **Cole Cooper**, UC Merced, Physics
7. **Mainul Sabbir**, UC Merced, Physics

- **Former Graduate Students**
  1. **Vaibhav Gupta**, Ms, software engineer at Intel, Sacramento, CA
  2. **Maryam Khazaei**, Ms, PhD student in Computer Science at UC Merced
- **Former Undergraduate Students**
  1. **Luis Maldonado Monge**, BS, UC Merced, graduate students at CSU Fullerton
  2. **Daniel He**, BS, NYU
  3. **Selma Strango**, BS UC Merced, graduate student at UC Davis
- **Former Visiting Students**
  1. **Thomas Bellotti**, PhD student at CMAP Ecole Polytechnique, winner of the "master thesis grand prize" from Ecole Polytechnique
  2. **Marc Mancini**, Ms, Ecole Polytechnique, corps des mines, France
  3. **Armand Touminet**, Ms, ENSTA paristech, France
  4. **Etienne Peillon**, Ms, ENSTA paristech, France

Synergistic Activities

- **Mentor Judge and Session Chair -** Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) conference (Fall 2019)
- **Hiring Committee Member -** Visiting Assistant Professor in Applied Mathematics search (U.C. Merced 2018, 2020, 2022), RTG postdoc ((Merced, 2022)
- **Graduate Admission Committee Member -** U.C. Merced 2018 - present
- **Graduate Continuing Fellowships Review Committee Member** U.C. Merced 2018, 2020,2022
- **Seminar Organizer -** Applied Mathematics weekly seminar (U.C. Merced spring 2017, Fall 2018, Fall 2022), Grad and Postdoc BioMechanics seminar (U.C. San Diego 2015-2016)
- **Session Chair-** Socal Fluid Seminar (Spring 2017)