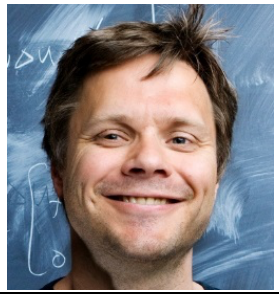
Curriculum vitae with track record (for researchers) (january 2025)



Role in the project Project manager ☐ Project partner ☒

Personal information

First name, Surname:	Kent-Andre Mardal		
Date of birth:	26/11/74	Sex:	Male
Nationality:	Norwegian		
Researcher unique identifier(s) (ORCID, ResearcherID, etc.):	ORCID: https://orcid.org/0000-0002-4946-1110. ResearcherID: https://publons.com/researcher/1443383/kent-andre-mardal/		
URL for personal website:	https://kent-and.github.io/		

Education

2003	Faculty/department - University/institution - Country
2002	PhD, Thesis title: Software and Numerical Methods for the Incompressible NavierStokes Equations. Supervisors: Hans Petter Langtangen and Aslak Tveito Department of Informatics, University of Oslo.
1999	Cand. Scient, Department of Mathematics, University of Oslo, Norway

Positions - current and previous

Year	Job title – Employer - Country
2024-	Chief Scientist, Scientific Computing Department, Simula Research Laboratory, Norway
2015-	Professor, Division of Mechanics, Department of Mathematics, University of Oslo, Norway
2014-	Adjunct Scientist, Scientific Computing Department, Simula Research Laboratory, Norway
2019-	Consultant for Expert Analytics
2014-2015	Associate Professor, Division of Mechanics, Department of Mathematics, University of Oslo, Norway
2007-2017	Group leader of Center of Excellence, Center for Biomedical Computing, Norway
2007-2014	Senior Scientific Researcher, Simula Research Laboratory, Norway
2003-2014	Associate Professor (20%), Department of Informatics, University of Oslo, Norway
2003-2007	Postdoctoral Fellow, Simula Research Laboratory, Norway

Project management experience

Year	Project – Funder – Role (last 5 years)
2025-2025	The Centre for Advanced Study (CAS) at The Norwegian Academy – Mathematcal challenges in the brain 3.4MNOK (co-PI)
2024-2029	ERC Advanced grant BRAIN FLUIDS - TRANSPORT AND CLEARANCE, PE1, 2.5 M Euro (PI)
2024-2029	KG Jebsen Center for Brain Fluids, 1 of six PIs, 22 MNOK

2022-2026	"Computational Hydrology project" (7 MNOK) strategic initiative "Sustainability" at the Faculty of Natural Sciences, UiO
2020-2024	Alzheimer´s physics, FRIPRO, 12 MNOK,PI
2019-2023	SciML – Scientific Machine Learning, IKTPLUSS 16 MNOK, PI

Supervision of students

Master's students	Ph.D. students	Post Docs	University/institution - Country
51 (32 as main supervisor and 3 ongoing)	35 (16 as main supervisor and 4 ongoing	15 (13 as main supervisor, 4 ongoing)	PhD: University of Oslo: 27, University of Siegen: 1, Istituto Italiano di Tecnologia: 1

Other relevant professional experiences (last 10 years)

Year	Description – Role
	Invited Referee for research councils
2024	DFG, German Research Foundation
2023	ANR, French National Research Agency; Welcome Trust, UK
2022	FWF Austrian Science Fund
2021	U.S. Army, Program: Biomathematics; FONDECYT, National Research and Dev. Agency, Chile
2019	Université libre de Bruxelles (ULB)
2017	The French National Research Agency (ANR)
2016	Canadian Council for Arts, Killam Fellowship; Research Foundation Flanders (FWO) Belgum
	Editorial responsibilites
2022-	Simula Springer Briefs on Computing
2019-	Fluids and Barriers in the CNS
2020-	Frontier Computational Physics
	Habilitation / PhD evaluation committee
2024	PhD thesis: Friederike Schafer (NTNU)
2023	PhD thesis: Björn Sigurdsson (University of Copenhagen)
2023	PhD thesis: Yun Bing (University of Oxford)
2019	PhD thesis: Paolo Zuniga (Universidad del Bio Bio, Chile)
2019	PhD thesis: Lorenzo Sala (University of Strasbourgh, France)
2019	PhD thesis: Mats Brun (University of Bergen, Norway)
2017	Habilitation thesis: Marcela Szopos (University of Strasbourg, France)
2017	PhD thesis: Helena Svihlova (University of Prague, Czech Republic)
2016	PhD thesis: Kartik Jain (University of Siegen, Germany)
2016	PhD thesis: Giulia Pizzichelli (Istituto Italiano di Tecnologia, Pisa, Italy)

Track record

Major scientific results:

Five **highly cited papers** according to Web of Science

Bojarskaite L, .., Mardal KA, Enger R. Nature Com, 2024 (> 81 citations, Google Scholar)

Bohr T, … Mardal KA .., Nedergaard M, IScience, 2022 (> 140 citations, Google Scholar)

Ringstad G, …, Mardal KA, Eide PK. JCI Insight. 2018. (>300 citations, Google Scholar)

Lee, JJ, Mardal KA, and Winther R. SIAM J. Scientific Computing. 2017. (>134 citations, Google Scholar)

Mardal KA, Winther R Numerical Linear Algebra with Applications. 2011. (cited > 300, Google Scholar)

Also, the book about ***the software framework FEniCS*** *:"Logg A, Mardal KA, Wells G, Springer 2012."* ***cited more than 4000 times since 2012*** (Google Scholar). The software system is used by thousands around the world.

Invited plenary presentations (selected)

Year	Conference – Location
2024	Numerical PDEs: Analysis, Algorithms, Data Challenges, ICERM, Brown US, *invited plenary*
2024	Lund Glymphatic Symposium, Lund, Sweden, *invited plenary*
2024	The pulsating brain, Royal Society, Brighton, UK*, invited plenary*
2024	The 7th Cerebrospinal Fluid Dynamics Symposium , Sydney, Australia, *invited plenary*
2023	CBMS Conference: Deep Learning and Numerical PDEs, Maryland, US, *invited plenary*
2022	The 6th Cerebrospinal Fluid Dynamics Symposium , Gainesville, Florida, US, *invited plenary*
2021	The Glymphatic System: From Theoretical Models to Clinical applications, Copenhagen, May 25-27, *invited plenary*
2020	Monash Workshop on Numerical Differential Equations and Applications 2020, Melbourne, Australia, Feb 10-14, *keynote*
2018	Workshop - Mathematical models in health sciences, Nantes, June 20-22, *keynote*
2018	INdAM Workshop "Mathematical and Numerical Modeling of the Cardiovascular System" Roma, April 16 - 19, 2018, *keynote*
2017	ENUMATH 2017 Conference, Voss, Norway, Sept 25-29, *keynote*
2017	4th Cerebrospinal Fluid Dynamics Symposium, Atlanta, US, June 19&20, *invited plenary*
2017	HPCSE 2017, Ostrava, Czech Republic, May 22-25, *keynote*
2017	Interpore 2017, Rotterdam, May 8-11, *invited plenary*
2017	American Association of Spine Radiology San Diego 2017, Feb 23-26, *keynote*
2015	American Socity of Neuroradiology, Chicago 2015, *keynote*
2015	International Hydrocephalus Imaging Working Group, Chicago 2015, April 25-30, *plenary*

In addition, I have held more than 150 talks in workshops and conferences.

Dissemination

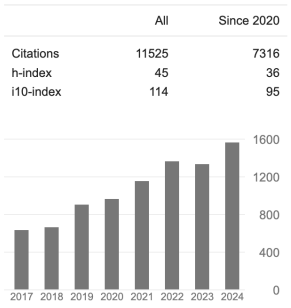
Year	**Newspaper/magazine/TV-channel**
2023	VG reports on our results findings of sleep related clearance and dementia.
2021	VG reports on our results findings of sleep related clearance and dementia.
2019	Both NRK, P1 and Forskning.no reports on our results breathing with brain clearance.
2018	Our research on Alzheimer appeared in VG, Norway´s most selling newspaper
2017	Our research on Alzheimer and clearance of waste during sleep is featured on NRK (NRK skole, lærerike programmer og klipp

Major contributions to the early careers of excellent researchers

Earlier students and post docs with permanent positions in the institute and university sector include Ole Elvetun, Kartik Jain, Timo Koch, Miroslav Kuchta, Karen Støverud, Kristian Valen-Sendstad, Eirik Valseth and Vegard Vinje. O. Elvetun and E Valseth are associate Professors at Norwegian University of Life Science, K. Jain is an assistant Professor at U. of Twente, Netherland, Timo Koch is assistant Professor in U. of Stuttgart, K. Støverud is a researcher at Sintef, and, M. Kuchta and K. Valen-Sendstad are researchers at Simula Research Laboratory.

BRIEF SUMMARY OF PUBLICATIONS:

139 articles with 227 co-authors, citations/H-index (Jan 2025): 5403/35 (Scopus), 11651/46 (Google Scholar). Publications with more than 100 citations: 20. Publications in top-tier journals: Nature Comm., Proceedings of National Science of Academy USA, Journal of Clinical Investigation Insight, Brain as well as top-tier journals in scientific computing, numerical analysis, biomechanics and neuroradiology; SIAM J. Sci Comput, SIAM J. Numer Anal., Fluids and Barriers of the CNS, J. Biomech, Am J Neuroradiol, NeuroImage. Two co-authored and two co-edited books, one co-authored book accepted at Springer. 51 book chapters or refereed proceedings.



Citations last 8 years
(Google scholar, Des 2024

TEN SELECTED PAPERS (Relevant for the proposal)

[1] Tveito A, Jæger KH, Kuchta M, Mardal KA, Rognes ME. *A cell-based framework for numerical modeling of electrical conduction in cardiac tissue.* Frontiers in Physics. 2017 Oct 10;5:48
[2] Tveito A, Mardal KA, Rognes ME. *Modeling excitable tissue: The EMI framework.* Springer Nature; 2021.
[3] Ringstad G, Valnes LM, Dale AM, Pripp AH, Vatnehol SA, Emblem KE, Mardal KA, Eide PK. *Brain-wide glymphatic enhancement and clearance in humans assessed with MRI.* Journal of Clinical Investigations: Insight. 2018 Jul 26;3(13)
[4] Holter KE, Kehlet B, Devor A, Sejnowski TJ, Dale AM, Omholt SW, Ottersen OP, Nagelhus EA, Mardal KA, Pettersen KH. *Interstitial solute transport in 3D reconstructed neuropil occurs by diffusion rather than bulk flow.* Proc. National Academy of Sciences. 2017
[5] Bojarskaite L, Vallet A, Bjørnstad DM, Gullestad Binder KM, Cunen C, Heuser K, Kuchta M, Mardal KA, Enger R. *Sleep cycle-dependent vascular dynamics in male mice and the predicted effects on perivascular cerebrospinal fluid flow and solute transport.* Nature communications. 2023 Feb 20;14(1):953.
[6] Koch T, Vinje V, Mardal KA. *Estimates of the permeability of extra-cellular pathways through the astrocyte endfoot sheath.* Fluids and Barriers of the CNS. 2023 Mar 20;20(1):20.
[7] Lee JJ, Mardal KA, Winther R. *Parameter-robust discretization and preconditioning of Biot's consolidation model.* SIAM J. on Scientific Computing. 2017.
[8] Zapf B, Haubner J, Kuchta M, Ringstad G, Eide PK, Mardal KA. *Investigating molecular transport in the human brain from MRI with physics-informed neural networks*. Scientific Reports. 2022 Sep 14;12(1):15475.
[9] Lee JJ, Piersanti E, Mardal KA, Rognes ME. *A mixed finite element method for nearly incompressible multiple-network poroelasticity.* SIAM Journal on Scientific Computing. 2019
[10] Vinje V, Zapf B, Ringstad G, Eide PK, Rognes ME, Mardal KA. Human brain solute transport quantified by glymphatic MRI-informed biophysics during sleep and sleep deprivation. Fluids and Barriers of the CNS. 2023.