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Nationality	Norwegian	Research IDs	Google Scholar: Hans Munthe-Kaas MathSciNet: 333145 ResearchGate: Hans Munthe-Kaas ORCID: 0000-0002-4456-3150

Education

1989	Dr.Ing. (PhD), Dept. of Mathematical Sciences, Norwegian Univ. of Science and Technology (NTNU).
1986	Siv.Ing. (MSc), Dept. of Mathematical Sciences, Norwegian Univ. of Science and Technology (NTNU).

Employment History

2005 – pres.	Professor, Department of Mathematics, University of Bergen
1997 – 2005	Professor (<i>by calling</i>), Department of Computer Science, University of Bergen
1991 – 1997	Associate professor, Department of Computer Science, University of Bergen
1996 – 2000	Adjunct prof. (Prof. II), Department of Mathematical Sciences, NTNU, Trondheim
1990 – 1995	Consulting scientist, SINTEF Industrial Mathematics, Trondheim
1990 – 1991	NAVF Post Doctoral Researcher, at CERFACS, Toulouse, France
1988 – 1990	Research scientist, SINTEF Industrial Mathematics, Trondheim, Norway
1986 – 1989	PhD Stipend, Department of Mathematical Sciences, NTNU, Trondheim

Honors and awards

1995	Carl-Erik Frøberg Prize in Numerical analysis
1990	Exxon Mobile research award for best PhD, NTNU, 1989
1986 – 1989	Jubilee Scholar, NTNU, Trondheim, Norway (1 of 3 scholarships for 75 th anniversary of NTNU)

Elected memberships of academies

2016	Elected member <i>The Norwegian Academy of Science and Letters</i>
2012	Elected member <i>The Royal Norwegian Society of Sciences and Letters</i> (DKNVS)
2007	Elected member <i>The Norwegian Academy of Technological Sciences</i> (NTVA)

Commissions of trust (recent)

2018 – 2022	Chair of the International Abel Prize Committee
2010 – 2018	Board of the Abel Prize in Mathematics
2017 – pres.	President of the Scientific Council of CIMPA (www.cimpa.info)
2017 – pres.	Editor in Chief <i>Journal Foundations of Computational Mathematics</i>
2012 – pres.	Editorial Board <i>Journal Foundations of Computational Mathematics</i>
2005 – 2011	Secretary for <i>The Society for the Foundations of Computational Mathematics</i>
2005 – pres.	Member board of Directors <i>The Society for the Foundations of Computational Mathematics</i>

Institutional responsibilities (recent)

- 2011 – 2014 Leader *Applied and Computational Mathematics group*, Dept. of Math., Univ. of Bergen
2010 – 2015 Leader *Professorship Promotion Committee in Appl. Math.* for UiOslo, UiBergen, UiTromsø and NTNU

Visits of duration at least one term

- 2011 – 2012 Visiting professor, DAMTP Univ. of Cambridge, UK (1 year sabbatical)
2004 (fall) Visiting professor, LaTrobe University, Melbourne, Australia
2002 – 2003 Group leader *Centre for Advanced Study*, Norwegian Academy of Science and Letters, Oslo.
1998 (fall) Invited visiting Professor, Mathematical Sciences Research Institute (MSRI), Berkeley, USA.
1997 Visiting professor, DAMTP Univ. of Cambridge, UK (1 year sabbatical)
1990 Visiting Research Scientist, CERFACS, Toulouse, France (1 year, Post Doc)
1987 (winter) Visiting Scholar, Stanford University, USA

Supervised PhDs

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| 2017 | Kristoffer Føllesdal (current student) | | |
| 2012 | Ferenc Bartha (with Warwick Tucker) | 2004 | Borislav Minchev |
| 2011 | Alexander Lundervold (w/K Ebrahimi-Fard) | 2003 | Stein Krogstad |
| 2008 | Oddvar Christiansen (with X-C Tai) | 2000 | Kenth Engø |
| 2007 | Johan Lie (with X-C Tai) | 1999 | Arne Marthinsen (w/ B. Owren) |

Organiser of scientific meetings

- 2017 *ENUMATH*, Voss, Norway (organising committee).
2017 SciCade Bath, UK (minisymposium organiser)
2016 Abelsymposium: *Computation and Combinatorics in Dynamics, Stochastics and Control* (Chair)
2015 CIMPA research school, *New interactions of combinatorics and probability*, Brazil (Sci. comm.)
2015 *New Develop. in Discrete Mech., Geom. Int. and Lie–Butcher Series*, ICMAT, Madrid (Sci. comm.)
2015 *Stochastic Systems Simulation and Control*, ICMS - Edinburgh (Scientific committee)
2014 *Foundations of Comput. Math.*, Montevideo (Plenary speakers and Funding committees)
2013 *Topics in Num. Anal. for Diff. Eqn*, ICMAT, Madrid (Sci. Com.)
2013 – 2017 *Heidelberg Laureate Forum* (Student selection committee mathematics)
2012 *Stochastic Systems Simulation and Control*, ICMAT Madrid (Co-organiser)
2011 ICIAM 2011, Vancouver (Minisymposium co-organiser)
2010 *Combinatorics and Control*, trimester ICMAT Madrid (Co-organiser)
2009 SciCade Beijing (minisymposium organiser)
2007 SciCade Saint-Malo, France (minisymposium organiser)
2006 Abelsymposium: *Mathematics and Computation, a Contemporary View* (Co-chair)
2005 PDE-based image processing, Oslo (organising committee)
2003 SciCade Trondheim (scientific committee)
2002 – 2003 *Special Year in Geometric Integration* at Centre for Adv. Study, Oslo (Co-chair)
2002 Foundations of Computational Mathematics, Minneapolis, USA (Minisymposium co-organiser)
1999 Foundations of Computational Mathematics, Oxford, UK (Minisymposium co-organiser)
1998 – 2017 *MAGIC*. Annual Norwegian workshop on Geometric Integration (20 times co-organiser)
1997 SciCade Grado, Italia (minisymposium organiser)
1997 Norsk Numerikk konferanse, Bergen (Chair)

Invited plenary / keynote presentations in major conferences

- 2017 SciCade, Bath, United Kingdom.
2011 Foundations of Computational Mathematics, Budapest, Hungary.
2009 ICOSAHOM (Int. conf. on spectral and high-order methods), Trondheim, Norway
2006 NumDiff, Halle, Germany.

Publications

- 2017 Fløystad, G. and Munthe-Kaas, H. (2017). Pre-and post-Lie algebras: The algebro-geometric view. *arXiv preprint arXiv:1704.06171*
- Ebrahimi-Fard, K., Mencattini, I., and Munthe-Kaas, H. (2017). Post-Lie algebras and factorization theorems. *Journal of Geometry and Physics*
- Munthe-Kaas, H. Z. and Føllesdal, K. K. (2017). Lie-Butcher series, geometry, algebra and computation. *arXiv preprint arXiv:1701.03654*
- 2016 Munthe-Kaas, H. and Verdier, O. (2016b). Integrators on homogeneous spaces: Isotropy choice and connections. *Foundations of Computational Mathematics*, 16(4):899–939
- McLachlan, R. I., Modin, K., Munthe-Kaas, H., and Verdier, O. (2016). B-series methods are exactly the affine equivariant methods. *Numerische Mathematik*, 133(3):599–622
- Munthe-Kaas, H. Z. (2016). Groups and symmetries in numerical linear algebra. In *Exploiting Hidden Structure in Matrix Computations: Algorithms and Applications*, pages 319–406. Springer International Publishing
- 2015 Ebrahimi-Fard, K., Lundervold, A., Mencattini, I., and Munthe-Kaas, H. Z. (2015a). Post-Lie algebras and isospectral flows. *Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)*, 11
- Ebrahimi-Fard, K., Lundervold, A., and Munthe-Kaas, H. (2015b). On the Lie enveloping algebra of a post-Lie algebra. *Journal of Lie theory*, 25(4):1139–1165
- Lundervold, A. and Munthe-Kaas, H. Z. (2015). On algebraic structures of numerical integration on vector spaces and manifolds. In *Faà di Bruno Hopf algebras, Dyson-Schwinger Equations, and Lie-Butcher series*, pages 219–264. European Mathematical Society
- Munthe-Kaas, H. and Verdier, O. (2016a). Aromatic Butcher series. *Foundations of Computational Mathematics*, 16:183–215
- Munthe-Kaas, H. and Verdier, O. (2015). Integrators on homogeneous spaces: Isotropy choice and connections. *Foundations of Computational Mathematics*
- 2014 Bartha, F. and Munthe-Kaas, H. Z. (2014). Computing B-series by automatic differentiation. *Discrete and Continuous Dynamical Systems*, 34(3):903–914
- Munthe-Kaas, H. Z., Quispel, G. R. W., and Zanna, A. (2014). Symmetric spaces and Lie triple systems in numerical analysis of differential equations. *BIT Numerical Mathematics*, 54(1):257–282
- 2013 Lundervold, A. and Munthe-Kaas, H. (2013). Backward error analysis and the substitution law for Lie group integrators. *Foundations of Computational Mathematics*, 13(2):161–186
- Munthe-Kaas, H. Z. and Lundervold, A. (2013). On post-Lie algebras, Lie-Butcher series and moving frames. *Foundations of Computational Mathematics*, 13(4):583–613
- 2012 Ebrahimi-Fard, K., Lundervold, A., Malham, S. J., Munthe-Kaas, H., and Wiese, A. (2012). Algebraic structure of stochastic expansions and efficient simulation. *Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, 468(2144):2361–2382
- Munthe-Kaas, H. Z., Nome, M., and Ryland, B. N. (2012). Through the kaleidoscope: Groups and Chebyshev-approximations from a computational point of view. In *Foundations of Computational Mathematics, Budapest 2011*, volume 403, page 188. Cambridge University Press
- Munthe-Kaas, H. and Sørenvik, T. (2012). Multidimensional pseudo-spectral methods on lattice grids. *Applied Numerical Mathematics*, 62(3):155–165

- 2011 Christiansen, S. H., Munthe-Kaas, H. Z., and Owren, B. (2011). Topics in structure-preserving discretization. *Acta Numerica*, 20:1–119
- Lundervold, A. and Munthe-Kaas, H. (2011). Hopf algebras of formal diffeomorphisms and numerical integration on manifolds. *Contemp. Math*, 539:295–324
- Ryland, B. N. and Munthe-Kaas, H. Z. (2011). On multivariate Chebyshev polynomials and spectral approximations on triangles. In *Spectral and High Order Methods for Partial Differential Equations*, pages 19–41. Springer Berlin Heidelberg
- 2009 Krogstad, S., Munthe-Kaas, H. Z., and Zanna, A. (2009). Generalized polar coordinates on Lie groups and numerical integrators. *Numerische Mathematik*, 114(1):161–187
- 2008 McLachlan, R. I., Munthe-Kaas, H. Z., Quispel, G., and Zanna, A. (2008). Explicit volume-preserving splitting methods for linear and quadratic divergence-free vector fields. *Foundations of Computational Mathematics*, 8(3):335–355
- Munthe-Kaas, H. and Wright, W. (2008). On the Hopf algebraic structure of Lie group integrators. *Foundations of Computational Mathematics*, 8(2):227–257
- Munthe-Kaas, H. and Owren, B. (2008). *Mathematics and Computation, a Contemporary View: The Abel Symposium 2006*, volume 3. Springer Abel Symposia
- 2006 Åhlander, K. and Munthe-Kaas, H. (2006). Eigenvalues for equivariant matrices. *Journal of computational and applied mathematics*, 192(1):89–99
- Hong, J., Liu, Y., Munthe-Kaas, H., and Zanna, A. (2006). Globally conservative properties and error estimation of a multi-symplectic scheme for Schrödinger equations with variable coefficients. *Applied Numerical Mathematics*, 56(6):814–843
- Munthe-Kaas, H. Z. (2006). On group Fourier analysis and symmetry preserving discretizations of PDEs. *Journal of Physics A: Mathematical and General*, 39(19):5563
- 2005 Åhlander, K. and Munthe-Kaas, H. (2005). Applications of the generalized Fourier transform in numerical linear algebra. *BIT Numerical Mathematics*, 45(4):819–850
- Haveraaen, M., Friis, H. A., and Munthe-Kaas, H. (2005). Computable scalar fields: A basis for PDE software. *The Journal of Logic and Algebraic Programming*, 65(1):36–49
- 2003 Munthe-Kaas, H. and Krogstad, S. (2003). On enumeration problems in Lie–Butcher theory. *Future Generation Computer Systems*, 19(7):1197–1205
- 2002 Chen, J.-B., Munthe-Kaas, H., and Qin, M.-Z. (2002). Square-conservative schemes for a class of evolution equations using Lie-group methods. *SIAM journal on numerical analysis*, 39(6):2164–2178
- Zanna, A. and Munthe-Kaas, H. (2002). Generalized polar decompositions for the approximation of the matrix exponential. *SIAM journal on matrix analysis and applications*, 23(3):840–862
- Åhlander, K., Haveraaen, M., and Munthe-Kaas, H. (2002). On Object Oriented frameworks and coordinate free formulations of PDEs. *Engineering with Computers*, 18:286–294
- 2001 Åhlander, K., Haveraaen, M., and Munthe-Kaas, H. Z. (2001). On the role of mathematical abstractions for scientific computing. In *The Architecture of Scientific Software*, pages 145–158. Springer US
- Engø, K., Marthinsen, A., and Munthe-Kaas, H. Z. (2001). Diffman: An object-oriented matlab toolbox for solving differential equations on manifolds. *Applied numerical mathematics*, 39(3):323–347

- Faltinsen, S., Marthinsen, A., and Munthe-Kaas, H. Z. (2001). Multistep methods integrating ordinary differential equations on manifolds. *Applied numerical mathematics*, 39(3):349–365
- Friis, H. A., Johansen, T. A., Haveraaen, M., Munthe-Kaas, H., and Drottning, Å. (2001). Use of coordinate-free numerics in elastic wave simulation. *Applied numerical mathematics*, 39(2):151–171
- Munthe-Kaas, H. Z., Quispel, G., and Zanna, A. (2001). Generalized polar decompositions on Lie groups with involutive automorphisms. *Foundations of Computational Mathematics*, 1(3):297–324
- Zanna, A., Engø, K., and Munthe-Kaas, H. Z. (2001). Adjoint and selfadjoint Lie-group methods. *BIT Numerical Mathematics*, 41(2):395–421
- 2000 Iserles, A., Munthe-Kaas, H. Z., Nørsett, S. P., and Zanna, A. (2000). Lie-group methods. *Acta Numerica 2000*, 9:215–365
- 1999 Munthe-Kaas, H. and Owren, B. (1999). Computations in a free Lie algebra. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, 357(1754):957–981
- Munthe-Kaas, H. (1999). High order Runge–Kutta methods on manifolds. *Applied Numerical Mathematics*, 29(1):115–127
- 1998 Munthe-Kaas, H. (1998). Runge-Kutta methods on Lie groups. *BIT Numerical Mathematics*, 38(1):92–111
- 1997 Marthinsen, A., Munthe-Kaas, H., and Owren, B. (1997). Simulation of ordinary differential equations on manifolds: some numerical experiments and verifications. *Modeling, identification and Control*, 18(1):75
- Munthe-Kaas, H. and Zanna, A. (1997). Numerical integration of differential equations on homogeneous manifolds. In *Foundations of computational mathematics*, pages 305–315. Springer Berlin Heidelberg
- Zanna, A. and Munthe-Kaas, H. (1997). Iterated commutators, Lie’s reduction method and ordinary differential equations on matrix Lie groups. In *Foundations of Computational Mathematics*, pages 434–441. Springer Berlin Heidelberg
- 1996 Arioli, M., Munthe-Kaas, H., and Valdettaro, L. (1996). Componentwise error analysis for FFTs with applications to fast Helmholtz solvers. *Numerical Algorithms*, 12(1):65–88
- Munthe-Kaas, H. and Haveraaen, M. (1996). Coordinate free numerics; closing the gap between ‘pure’ and ‘applied’ mathematics. *ZAMM Z. angew. Math. Mech.*, 76(S1):487–488
- 1995 Munthe-Kaas, H. (1995). Lie–Butcher theory for Runge–Kutta methods. *BIT Numerical Mathematics*, 35(4):572–587
- 1993 Munthe-Kaas, H. (1993). Superparallel FFTs. *SIAM Journal on Scientific Computing*, 14(2):349–367
- 1992 Munthe-Kaas, H. (1992). Generalized shuffle-exchange networks. *Parallel Processing: CONPAR 92—VAPP V*, pages 49–54

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