

## CURRICULUM VITAE

- Name:** Helge Holden
- Position:** Professor of mathematics
- Address:** Department of Mathematical Sciences, Norwegian University of Science and Technology, (NTNU), Alfred Getz vei 1, NO-7491 Trondheim, Norway
- Email/URL:** holden@math.ntnu.no, [www.math.ntnu.no/~holden](http://www.math.ntnu.no/~holden)
- Born:** September 28, 1956 in Oslo. Norwegian nationality
- Education:** Cand. real., University of Oslo, 1976–81 (major: mathematics).  
Dr. Philos., University of Oslo, 1985. Advisor: Prof. Raphael Høegh-Krohn
- Positions:** Research Assistant, University of Oslo, 1982–86  
Associate Professor, University of Trondheim, 1986–1990  
Professor, Norwegian University of Science and Technology, 1991– present
- Longer stays abroad:** Visiting Member, Courant Institute of Mathematical Sciences, New York University, 8/85–7/86  
Visiting member, California Institute of Technology, 1/89–7/89  
Visiting professor, University of Missouri–Columbia, 8/96–7/97
- Memberships:** Norwegian Academy of Science and Letters (Elected)  
Royal Norwegian Society of Sciences and Letters (Elected)  
Norwegian Academy of Technological Sciences (Elected)  
European Academy of Sciences (Elected)  
Fellow, American Mathematical Society  
Norwegian, European, and American Mathematical Society  
International Association of Mathematical Physics (IAMP)  
Society for Industrial and Applied Mathematics (SIAM)
- Honors:** The King of Norway has been informed in the Council of State about the cand. real. exam 1981,  
Fulbright Scholarship 1985–86,  
Lucy B. Moses “Thanks to Scandinavia” Scholarship 1985–86,  
The Faculty’s award for 2005 for popularization of science.
- Offices:** Member of the Board of NTNU, 2009–17,  
President of the Royal Norwegian Society of Sciences and Letters, 2014–16,  
Secretary, The International Mathematical Union, 2015–18,  
Chair, The European Research Council Consolidator Grant panel, 2013, 2015  
Chair, Scientific Advisory Board, The Erwin Schrödinger Institute, Vienna, Austria, 2016–19,  
Chair, the Onsager Committee, NTNU,  
Chair, The Niels Henrik Abel Board, 2010–14,  
Chair, eVITA Committee, Research Council of Norway, 2009–15,  
President, European Consortium for Mathematics in Industry, 2004–06,  
Vice-president, European Mathematical Society, 2007–10, Secretary 2003–06,  
Chair, SUNT Committee (2000–06), BeMatA (2000–06), Research Council of Norway,  
Chair, Department of Mathematical Sciences 7/90–12/92.
- Editor:** Member of editorial board of Journal of Nonlinear Mathematical Physics, Transactions of the Roy. Norw. Soc. of Sciences and Letters, Springer Undergrad. Text Math. Technology, Inter J. Differential Eqs., J. Mathematics in Industry, Vietnam J. Mathematics
- External engagements:** Adjunct professor, Centre of Mathematics for Applications, University of Oslo, 2002–15  
Visiting professor, Simula Research Laboratory, Oslo ([www.simula.no](http://www.simula.no)), 2001–05
- Students:** Supervised 24 PhD students (3 current), supervised more than 80 master students.
- Grants:** Principal Investigator and participant in several major grants. “Toppforsk” grant 2016–2020
- Talks:** More than 100 international lectures since 1990,  
Keynote lecture, ECMOR IV conference 1994,  
Invited speaker, HYKE-2 Conference, Paris, 2004,  
Invited speaker, Fourth European Congress of Mathematics, 2004.
- Miscellaneous:** Co-organized a special semester at the Mittag-Leffler Institute, Sweden, Fall 2005 and Fall 2016.  
Co-organizer of a special year at the Centre for Advanced Study, Oslo, 2008–09. Participant in evaluations at Aalborg University, Uppsala University (chair), Technical University of Denmark, University of Gothenburg, Royal Institute of Technology, Stockholm, and two evaluations organized by the Swedish National Agency for Higher Education.

## PUBLICATIONS (RECENT)

### (i) Books

- [1] **Solvable Models in Quantum Mechanics**  
*Texts and Monographs in Physics*. Springer-Verlag, Berlin, 1988, 452 pp.  
(with S. Albeverio, F. Gesztesy, R. Høegh-Krohn)  
Translation into the Russian, Mir, Moscow 1991. Second edition, Chelsea Publishing, 2005.
- [2] **Stochastic Partial Differential Equations. A Modeling, White Noise Functional Approach**  
Birkhäuser Verlag, Basel, 1996, 231 pp. Second edition *Universitext*, Springer 2010, 305 pp.  
(with J. Ubøe, B. Øksendal, T. Zhang)
- [3] **Sturm–Liouville Operators and Hilbert Spaces: A Brief Introduction**  
Tapir forlag, Trondheim, 2000, 90 pp. Second edition, 2001.
- [4] **Front Tracking for Hyperbolic Conservation Laws**  
Applied Mathematical Sciences, volume 152. Springer-Verlag, New York, 2002, 380 pp.  
2nd corr. printing, 2007, softcover and eBook, 2011. 2nd edition 2015, 516 pp.  
(with N. H. Risebro)
- [5] **Soliton Equations and Their Algebro-Geometric Solutions**  
**Volume I:  $(1 + 1)$ -Dimensional Continuous Models**  
Cambridge University Press, Cambridge, 2003, 505 pp.  
(with F. Gesztesy)
- [6] **Soliton Equations and Their Algebro-Geometric Solutions**  
**Volume II:  $(1 + 1)$ -Dimensional Discrete Models**  
Cambridge University Press, Cambridge, 2008, 452 pp.  
(with F. Gesztesy, J. Michor, G. Teschl)
- [7] **Operator Splitting for Nonlinear Partial Differential Equations with Rough Solutions**  
EMS Series of Lectures in Mathematics, EMS Publishing House, Zurich, 2010, 226 pp.  
(with K. H. Karlsen, K.-A. Lie, N. H. Risebro)

### (ii) Recent publications in international, refereed journals<sup>1</sup>

- [79] Global dissipative multipeakon solutions for the Camassa–Holm equation  
*Communications in Partial Differential Equations*, **33** (2008) 2040–2063.  
(with X. Raynaud)
- [80] Front tracking for a model of immiscible gas flow with large data  
*BIT Numerical Mathematics*, **50** (2010) 331–376.  
(with N. H. Risebro and H. Sande)
- [81] Symmetric waves are traveling waves  
*International Mathematics Research Notices*, 2009, Article ID rnp100, 19 pp.  
(with M. Ehrnström and X. Raynaud)
- [82] Zero diffusion-dispersion-smoothing limits for a scalar conservation law with discontinuous flux function  
*International Journal of Differential Equations*, **2009** (2009), Article ID 279818, pp. 33.  
(with K. H. Karlsen and D. Mitrovic)
- [83] Lipschitz metric for the Hunter–Saxton equation  
*Journal de Mathématiques Pures et Appliquées*, **94** (2010) 68–92.  
(with A. Bressan and X. Raynaud)
- [84] The Kolmogorov–Riesz compactness theorem  
*Expositiones Mathematicae*, **28** (2010) 385–394. Addendum, *ibid.* **34** (2016) 243–245.  
(with H. Hanche-Olsen)
- [85] Operator splitting for the KdV equation  
*Mathematics of Computation*, **80** (2011) 821–846.  
(with K. H. Karlsen, N. H. Risebro, and T. Tao)
- [86] Global semigroup of conservative solutions of the nonlinear variational wave equation  
*Archive for Rational Mechanics and Analysis*, **201** (2011) 871–964.  
(with X. Raynaud)

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<sup>1</sup>Numbers refer to complete list of publications.

- [87] Strong compactness of approximated solutions to degenerate elliptic-hyperbolic equations with discontinuous flux function  
*Acta Mathematica Scientia* **29B** (2009) 1573–1612  
(with K. H. Karlsen, D. Mitrovic, and E. Yu. Panov)
- [88] Lipschitz metric for the periodic Camassa–Holm equation  
*Journal of Differential Equations* **250** (2011) 1460–1492.  
(with K. Grunert and X. Raynaud)
- [89]  $L^\infty$  solutions for a model of polytropic gas flow with diffusive entropy  
*SIAM Journal of Mathematical Analysis*, **43** (2011) 2253–2274.  
(with H. Frid and K. H. Karlsen)
- [90] The damped string problem revisited  
*Journal of Differential Equations* **251** (2011) 1086–1127.  
(with F. Gesztesy)
- [91] Lipschitz metric for the Camassa–Holm equation on the line  
*Discrete and Continuous Dynamical Systems, Series A*, **33** (2013) 2809–2827.  
(with K. Grunert and X. Raynaud)
- [92] Abstract wave equations and associated Dirac-type operators  
*Annali di Matematica Pura ed Applicata*, **191** (2012) 631–676.  
(with F. Gesztesy, J. M. Goldstein, and G. Teschl)
- [93] Operator splitting for two-dimensional incompressible fluid equations  
*Mathematics of Computation*, **82** (2013) 719–748.  
(with K. H. Karlsen and T. Karper)
- [94] Operator splitting for partial differential equations with Burgers nonlinearity  
*Mathematics of Computation*, **82** (2013) 173–185.  
(with C. Lubich and N. H. Risebro)
- [95] Global conservative solutions of the Camassa–Holm equation for initial data with nonvanishing asymptotics  
*Discrete and Continuous Dynamical Systems, Series A*, **32** (2012) 4209–4227.  
(with K. Grunert and X. Raynaud)
- [96] Global solutions for the two-component Camassa–Holm system  
*Communications in Partial Differential Equations* **37** (2012) 2245–2271.  
(with K. Grunert and X. Raynaud)
- [97] Operator splitting for well-posed active scalar equations  
*SIAM Journal of Mathematical Analysis*, **45** (2013) 152–180.  
(with K. H. Karlsen and T. Karper)
- [98] Convergence of a fully discrete finite difference scheme for the Korteweg–de Vries equation  
*IMA Journal of Numerical Analysis*, doi:10.1093/imanum/dru040.  
(with U. Koley and N. H. Risebro)
- [99] On the inverse problem for scalar conservation laws  
**30** (2014) 035015 (35 pp.).  
(with F. S. Priuli and N. H. Risebro)
- [100] Global dissipative solutions of the two-component Camassa–Holm system for initial data with nonvanishing asymptotics  
*Nonlinear Analysis: Real World Problems*, **17** (2014) 203–244.  
(with K. Grunert and X. Raynaud)
- [101] A continuous interpolation between conservative and dissipative solutions for the two-component Camassa–Holm system  
*Forum of Mathematics, Sigma* **3** (2015), e1, 73 pp.  
(with K. Grunert and X. Raynaud)
- [102] On factorizations of analytic operator-valued functions and eigenvalue multiplicity questions  
*Integral Equations and Operator Theory* **82** (2015) 61–94.  
(with F. Gesztesy and R. Nichols)
- [103] On the Braess paradox with nonlinear dynamics and control theory  
*Journal of Optimal Theory and Applications* **168** (2016) 216–230  
(with R. Colombo)
- [104] The general peakon-antipeakon solution for the Camassa–Holm equation  
*Journal of Hyperbolic Differential Equations* **13** (2016) 353–380  
(with K. Grunert)

(iii) **Publications in proceedings of conferences (selected)**

- [43] On the Camassa–Holm and the Hunter–Saxton equations  
In *European Conference of Mathematics. Stockholm, June 27–July 2, 2004*.  
Editor A. Laptev. European Mathematical Society, Zurich, 2005, pp. 173–200.

(iv) **Books edited (selected)**

- [2–3] **Ideas and Methods in Mathematical Analysis, Stochastics, and Applications. Ideas and Methods in Quantum and Statistical Physics. In Memory of Raphael Høegh-Krohn (1938-1988)**  
Cambridge University Press, Cambridge 1992, 509 pp. and 542 pp.  
(jointly edited with S. Albeverio, J. E. Fenstad, T. Lindstrøm)
- [4] **The Collected Works of Lars Onsager (With Commentary)**  
World Scientific, Singapore, 1996, 1088 pp.  
(with P. C. Hemmer, S. K. Ratkje)
- [5–6] **Stochastic Processes, Physics and Geometry: New Interplays. Vols. I and II. Volumes in Honor of Sergio Albeverio**  
CMS Conference Proceedings, Volume 28–29  
Canadian Mathematical Society, Providence (USA), 2000, 343 pp. and 645 pp.  
(jointly edited with F. Gesztesy, J. Jost, S. Paycha, M. Röckner, S. Scarlatti)
- [7] **The Abel Prize 2003–2007. The First Five Years.**  
Springer, Heidelberg, 2010, 326 pp.  
(jointly edited with R. Piene)
- [8] **Nonlinear Partial Differential Equations and Hyperbolic Wave Phenomena**  
Contemporary Mathematics, American Mathematical Society, Providence, Vol. 526, 2010, 389 pp.  
(jointly edited with K. H. Karlsen)
- [9] **Nonlinear Partial Differential Equations. The Abel Symposium 2010**  
Abel Symposia, Vol. 7, Springer, Heidelberg, 2012, 360 pp.  
(jointly edited with K. H. Karlsen)
- [11] **Spectral Analysis, Differential Equations and Mathematical Physics. A Festschrift in Honor of Fritz Gesztesy’s 60th Birthday**  
Proceedings of Symposia in Pure Mathematics,  
American Mathematical Society, Providence, Vol. 87, 2013, 376 pp.  
(jointly edited with B. Simon and G. Teschl)
- [12] **The Abel Prize 2008–2012**  
Springer, Heidelberg, 2014, 571 pp.  
(with R. Piene)
- [13] **Hyperbolic Conservation Laws and Related Analysis with Applications. Edinburgh, September 2011.**  
Springer Proceedings in Mathematics & Statistics, Volume 49,  
Springer, New York, 2014, 384 pp.  
(With G.-Q. G. Chen and K. H. Karlsen)

(v) **Miscellaneous (selected)**

- [13] Matematikkens bidrag til Olje-Norge (In Norwegian)  
Featured article, Aftenposten, May 24, 2005
- [16] Om Poincaré, Perelman og kuler (In Norwegian)  
Featured article, Morgenbladet, October 13-19, 2006.
- [25] Matematikkens gave (In Norwegian)  
Featured article, Aftenposten, March 21, 2012  
(with R. Piene)
- [41] Oljefondet kan spare penger (In Norwegian)  
“Forskning viser at...”, Dagens Næringsliv, July 23, 2016  
(with L. Holden)