

# CURRICULUM VITAE

ALLAN PETER ENGSIG-KARUP

Date of birth: August 3rd, 1977.  
Nationality: Denmark  
Languages: Danish (native), English (fluent), German (fair), French (fair).  
Children: Sarah (2006).

## Contact details

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## Employment Record

- **PostDoc, Danish Technical Research Council (STVF grant no. 274-06-0030), Maritime Engineering, Technical University of Denmark. Aug 2006-Dec 2008. (Including Paternity leave: 10 weeks, Jan-Mar 2007 )**

*Project title: Direct and efficient solution of time-dependent potential flow problems in complex geometries.*

*Subjects: Fully nonlinear modeling of potential flows, High-order Boussinesq theory, wave-structure interaction, Large-scale computations.*

*Collaborator(s): Assoc. Prof. Harry B. Bingham.*

- **Ph.D. candidate, Applied Math & Maritime Engineering, Technical University of Denmark. Aug 2003-Aug 2006.**

*Thesis title: Unstructured nodal DG-FEM solution of high-order Boussinesq-type equations*

*Project title: Numerical techniques for solving Boussinesq equations for fully nonlinear and extremely dispersive water waves.*

*Subjects: Development of a new high-order Boussinesq model with support for geometric complex domains*

*Supervisors: Prof. Per A. Madsen & Assoc. Prof. Harry B. Bingham.*

*Mentor: Prof. Jan Hesthaven (Brown University).*

## Educational Record

- **Visiting Scholar (1 week), Dep. Civil And Environmental Engineering, Louisiana State University, New Orleans, USA. June 2008.**

*Coastal modeling.*

*Visiting group of Assoc. Prof. Jim Chen.*

- **Visiting Scholar (3 weeks), Dep. Applied mathematics, Rice University, Houston, Texas, USA. Jan 2006.**  
*Discontinuous Galerkin Finite Element Methods.*  
*Mentor: Assoc. Prof. Tim Warburton.*
- **Visiting Scholar (7 months), Dep. Applied mathematics, Brown University, Providence, Rhode Island, USA. Sep 2004-Mar 2005.**  
*Applied mathematics, numerical computing, spectral elements methods, Discontinuous Galerkin Finite Element Methods, finite volume methods.*  
*Mentor: Prof. Jan S. Hesthaven.*
- **M.Sc., Maritime Engineering, Technical University of Denmark. Jan 2003.**  
*Thesis title: Numerical techniques for solving Boussinesq equations for fully nonlinear and extremely dispersive water waves.*  
*Advisers: Prof. Per A. Madsen & Assoc. Prof. Harry B. Bingham.*
- **Study abroad (6 months), Dep. Applied mathematics, Adelaide University, South Australia. Jul 2001-Jan 2002.**  
*Numerical methods in engineering, number theory, hydrodynamics, applied mathematics and computational fluid dynamics.*

## Teaching experience

- Teacher in 02637 Advanced Matlab programming, Technical University of Denmark, Spring 2008.
- Teaching assistant in 02685 Numerical analysis of differential equations, Technical University of Denmark, Spring 2008.
- Teaching assistant in a Ph.D. special course on "Fortran and MPI" at Department of mathematical modeling (IMM), Technical University of Denmark, Jan 2008.
- Teacher, Ph.D. special course on "A DG-FEM shallow water solver for fluid damping systems", Technical University of Denmark, Apr-Dec 2007.
- Teaching assistant in 41319 Computational Fluid Dynamics, Technical University of Denmark, autumn (2005,2006,2007).
- Teaching assistant in 41223 Linear and Nonlinear Wave Dynamics, Technical University of Denmark, autumn (2006,2007).
- Teaching assistant in 41124 Computational Coastal Hydrodynamics, Technical University of Denmark, Jan 2004.
- Teaching assistant in 41260 Yacht Sailing, Technical University of Denmark, autumn 2003.

## Committee work

- Board member of the Ph.D.-committee, Technical University of Denmark, Jan 2004 - Aug 2006.

## Department work

- Initiator/organizer (with PostDoc Henrik Bredmose) of SKK miniseminars at MEK, Technical University of Denmark, Since May 2007.  
<http://www.skkmek.dtu.dk/Forskning/Miniseminars.aspx>

## Former students

- M.Sc. Ole Lindberg (2007)

## Reviewer

- 27th International Conference on Offshore Mechanics and Arctic Engineering (2008)
- Journal of Ocean Engineering (since 2007).
- Journal of Engineering Mathematics (since 2006).
- Journal of Scientific Computing (since 2006).

## Papers

- Engsig-Karup, A. P., Bingham, H. B., and Lindberg, O. An efficient flexible-order model for 3D nonlinear water waves. *Submitted for Journal of Computational Physics, December 2007.*
- Engsig-Karup, A. P., Hesthaven, J.S., Bingham, H. B., and Warburton, T. 2006 DG-FEM solutions for nonlinear wave-structure interaction using Boussinesq equations. *To appear in Coastal Engineering.*
- Engsig-Karup, A. P., Hesthaven, J.S., Bingham, H. B., and Madsen, P. M. 2006 Nodal DG-FEM solutions of high order Boussinesq-type equations. *Journal of Engineering Mathematics*, 46, pp. 351–370.

## Conferences/Seminars

- Engsig-Karup, A. P., Bingham, H. B., and Lindberg, O. 2008 An efficient flexible-order model for coastal and ocean water waves. In *First American Academy of Mechanics Conference*, June, New Orleans, USA, 2008.
- Bingham, H. B., Engsig-Karup, A. P., and Lindberg, O. 2008 Multigrid preconditioning for efficient solution of the 3D Laplace problem for wave-body interaction. In *23rd Intl. Wrkshp. Water Waves and Floating Bodies*, April, Jeju Island, South Korea, 2008.
- Engsig-Karup, A. P., Hesthaven, J.S., Bingham, H. B., and Warburton, T. 2007 DG-FEM solution for nonlinear wave-structure interaction using Boussinesq-type equations, *International Conference On Spectral and High Order Methods*, Chinese Academy of Sciences, Beijing, China, 2007.
- Bingham, H. B., Engsig-Karup, A. P., and Lindberg, O. 2007 A high-order finite difference method for nonlinear wave-structure interaction. In *22st Intl. Wrkshp. Water Waves and Floating Bodies*, Zagreb, Croatia, 2007.

- Engsig-Karup, A. P., Hesthaven, J.S, and Bingham, H. B. 2006 DG-FEM in computational hydrodynamics. *STVF seminar*, Technical University of Denmark, Kgs-Lyngby, Denmark, 2006.
- Engsig-Karup, A. P., Bingham, H. B., Madsen, P. M., and Hesthaven, J.S. 2006 An unstructured DG-FEM method for nonlinear wave-structure interaction. In *21st Intl. Wrkshp. Water Waves and Floating Bodies*, Loughborough, England, 2006.
- Engsig-Karup, A. P., Bingham, H. B., Hesthaven, J.S., and Madsen, P. M. 2005 A nodal discontinuous Galerkin spectral/hp method for high order Boussinesq-type equations. *Third M.I.T. Conference on Computational Fluid and Solid Mechanics*, Boston, USA.
- Bingham, H.B., Madsen, P.A., Fuhrman, D.R., Engsig-Karup, A.P. and Jamois, E. Coastal and ocean wave modelling. Poster presentation at DCSC seminar dag, Aarhus University, Aarhus, Denmark, 2005.
- Eskilsson, C., Engsig-Karup, A. P., Sherwin, S. J., Hesthaven, J. S., and Bergdahl, L. The next step in coastal numerical models: spectral/hp element methods? *Waves 2005*, Madrid, Spain, July.

## Computer and software skills

- Operating Systems: Windows, Unix/Linux.
- Programming experience: Fortran, C, C++, Matlab, MPI, OpenMP.
- Analysis software: Mathematica, Maple.
- Word-processing/Type-setting: Latex, Word.
- Web and databases: HTML, PHP, SQL, ACCESS.