

# Curriculum Vitae for Kim Knudsen

## *Personal details*

Name: Kim Knudsen  
Email: kiknu@dtu.dk  
Born: February 14, 1975  
Citizenship: Danish  
Marital state: Married  
Children: Two

## *Employment*

**Since 2008** : Lektor (Associate Professor) at DTU Compute.  
**2008**: Lektor (Associate Professor) at the Department of Mathematical Sciences, Aalborg University.  
**2006 – 2007**: Adjunkt (Assistant Professor) at the Dept. of Mathematical Sciences, Aalborg University.  
**2005 – 2006**: Post doc at the Department of Mathematical Sciences, Aalborg University.  
**2004 – 2005**: Post doc at the Department of Mathematics, University of Washington, Seattle.  
**2003 – 2004**: Adjunkt (Assistant Professor) at the Dept. of Mathematical Sciences, Aalborg University.  
**2002 – 2003**: Post doc at MaPhySto, the Centre for Mathematical Physics and Stochastics, Aalborg University.

## *Degrees*

**2002**: Ph.D. at the Department of Mathematical Sciences, Aalborg University.  
**1999**: Cand. Scient. (M.Sc.), Mathematics and Computer Science, Aalborg University.

## *Research interests*

Applied mathematical analysis. Main interest is Inverse Problems for Partial Differential Equations arising in Mathematical Physics, Engineering, Medical Imaging etc. with particular attention to mathematical analysis and numerical aspects of Inverse Problems. Interests also includes Biomathematics.

## *Research funding(current)*

- Affiliated with “High Definition Tomography” (ERC advanced grant; PI Per Christian Hansen, DTU).
- Co-PI in “Improved Impedance Tomography with Hybrid Data” funded by grant no. 4002-00123 from the Danish Council for Independent Research | Natural Sciences.

## *PhD Students*

- Jesper Sandvig Mariegaard (2009): *Numerical approximation of HUM with applications to Inverse Problems*. Joint with Per Christian Hansen and Michael Pedersen
- Lai Zhang (2011): *Mathematical models of ecology and evolution*. Joint with Ken Haste Andersen and Uffe Høgsbro Thygesen, DTU Aqua.
- Louis Pedersen (2013): *Mathematic Models for the Traffic Speed Deflectometer*. Industrial PhD at Greenwood Engineering. With Poul Hjorth, DTU Mathematics.
- Kristoffer Hoffmann (current): *Reconstruction methods for inverse problems with partial data*.
- Henrik Garde (current): *Prior Information in Inverse Boundary Problems*

## *Science service and administration*

- 2009 Applied Inverse Problems conference in Vienna, Austria: Minisymposium on Reconstruction algorithms and complex geometrical optics. Co-organizers: Jennifer Mueller and Samuli Siltanen
- 2012 Workshop Inverse problems and numerical methods in applications, Institut für Werkstofftechnik, IWT, Bremen. Co-organizer: Mirza Karamehmedovic
- Member DCAMM Scientific Council (2011-2013)
- Pedagogical coordinator at DTU Compute and organizer of DTU Compute seminar on education

## Publication list for Kim Knudsen

### *Journal publications*

1. Kim Knudsen, *On a local uniqueness result for the inverse Sturm-Liouville problem*, Ark. Mat. 39 (2001), no. 2.
2. Kim Knudsen, *A new direct method for reconstructing conductivities in the plane*, Physiological Measurements 24 (2003), no. 2.
3. Kim Knudsen and Alexandru Tamasan, *Reconstruction of less regular conductivities in the plane*, Comm. Partial Differential Equations, 29 (2004), no. 3-4.
4. Kim Knudsen, Jennifer Mueller and Samuli Siltanen, *Numerical solution method for the dbar-equation in the plane*, Journal of Computational Physics, 198 (2004), no. 2.
5. Horia Cornean and Kim Knudsen, *Reconstruction from one boundary measurement of a potential homogeneous of degree zero*, J. Inverse Ill-Posed Probl., 13 (2005), no. 5.
6. Kim Knudsen, *The Calderón problem with partial data for less smooth conductivities*, Comm. Partial Differential Equations, 31 (2006), no. 1.
7. Horia Cornean, Kim Knudsen and Samuli Siltanen, *Towards a d-bar reconstruction method for three-dimensional EIT*, J. Inverse Ill-Posed Probl., 14 (2006), no. 2.
8. Kim Knudsen, Matti Lassas, Jennifer Mueller and Samuli Siltanen, *D-bar method for Electrical Impedance Tomography with discontinuous coefficients*, SIAM J. Appl. Math., 67 (2007), no. 3.
9. Kim Knudsen and Mikko Salo, *Determining Non-smooth First Order Terms from Partial Boundary Measurements*, Inverse Problems and Imaging, 1 (2007), no. 2.
10. Kim Knudsen, Matti Lassas, Jennifer Mueller and Samuli Siltanen: *Regularized D-bar reconstruction for the inverse conductivity problem*, Inverse Problems and Imaging, 3 (2009), no. 4.
11. Jutta Bikowski, Kim Knudsen, Jennifer Mueller: *Direct numerical reconstruction of conductivities in three dimensions*, Inverse Problems, 27 (2011), no. 1.
12. Fabrice Delbary, Per Christian Hansen, Kim Knudsen, *Electrical Impedance Tomography: 3D Reconstructions using Scattering Transforms*, Applicable Analysis 91 (2012), no. 4.
13. Lai Zhang, Uffe Høgsbro Thygesen, Kim Knudsen, Ken Haste Andersen: *Trait diversity promotes stability of community dynamics*, Theoretical Ecology (2012).
14. Mirza Karamehmedovic and Kim Knudsen: *Inclusion estimation from a single electrostatic boundary measurement*. Inverse Problems 29 (2013), no. 2.
15. Lai Zhang, Martin Hartvig, Kim Knudsen, Ken H. Andersen: *Size-based predictions of food web patterns*. Theoretical Ecology (2013)

### *Proceeding publications*

1. Kim Knudsen, Matti Lassas, Jennifer Mueller and Samuli Siltanen, *Reconstructions of Piecewise Constant Conductivities by the D-bar Method for Electrical Impedance Tomography*. Proceedings of Applied Inverse Problems 2007, Vancouver.
2. Kim Knudsen, Jennifer Mueller, *The Born approximation and Calderón's method for reconstruction of conductivities in 3-D*. Proceedings of The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, 2010.
3. Fabrice Delbary, Per Christian Hansen, Kim Knudsen, *A direct numerical reconstruction algorithm for the 3D Calderón problem*. Journal of Physics: Conference Series — International Conference on Inverse Problems, 2010.
4. Mirza Karamehmedovic, Kim Knudsen, Thomas Wriedt, *Numerical Reconstruction of Perfectly Conducting Inclusions from One Electrostatic Boundary Measurement*, PIERS 2012, Kuala Lumpur.
5. Sidsel Marie Nørholm Sjøj and Finn Jacobsen, Kim Knudsen, Karim Haddad and Jørgen Hald, *Noise mapping inside a car cabin*, BNAM 2012, Odense.