



UFFC-S Nomination Committee

Statement of Interest

With this letter, I wish to formalize my interest in becoming a member of the UFFC-S Administration Committee.

31 October 2022

ahua

As many past and present AdCom members will know, I have been an active member of the ferroelectrics community. I realize I have benefited greatly from its activities and camaraderie, and now wish to reciprocate by contributing to its main organizing body.

Starting with a postdoc grant in 2016, I have continuously spearheaded the growth of ferroelectrics research in Denmark. As well as establishing and leading a group in the field, I have actively encouraged complementary projects across the country that span academia and industry. During this year's ISAF, Denmark contributed at least 14 participants – significant for a country of 5.5 million.

I also have a track-record of establishing and administering scientific initiatives and societies. These activities range from initiating a mentoring scheme within my department, to organizing a national workshop on ferroelectric, piezoelectric and dielectric materials to coincide with a visit from the IEEE Distinguished Lecturer (Paul Muralt). In addition to attending nearly every ISAF since 2013, I have also served as a judge and chair for its student competitions. As a ceramicist, I am also active in the Danish Ceramic Society, of which I currently serve as president.

In joining AdCom, I hope to contribute to nurture UFFC-S' collaborative and friendly atmosphere in an otherwise increasingly competitive work environment.

Best regards

Astri Bjørnetun Haugen

Associate professor
DTU Energy

Contact information for Astri Bjørnetun Haugen

First Name: Astri

Middle name: Bjørnetun

Last name: Haugen

Affiliation: Department of Energy Conversion and Storage (DTU Energy), Technical University of Denmark (DTU)

Address: Anker Engelundsvej, building 301, DK-2800, Kgs. Lyngby, Denmark

Email address: ahua@dtu.dk

Phone number: +45 21560919

IEEE Membership Number: 95800961

CV - ASTRI BJØRNETUN HAUGEN

Date of birth: 27 June 1985
Nationality: Norwegian
E-mail: ahua@dtu.dk
Mobile phone: +45 21 56 09 19
ORCID: 0000-0001-6981-9856
Career breaks: 28 weeks of maternity leave (2020)



PROFESSIONAL EXPERIENCE

- 01.05.2020-
present **Associate Professor**
DTU Energy, Technical University of Denmark (DTU)
- 01.08.2016-
30.04.2020 **Researcher**
DTU Energy, Technical University of Denmark (DTU)
- 11.08.2014-
-31.07.2016 **Postdoc**
DTU Energy, Technical University of Denmark (DTU)
- 01.01.2011
-20.07.2011 **Managing Director**
Cerpotech AS, Trondheim, Norway
A start-up producing high-quality advanced oxides for sustainable energy technologies. My role: daily operation, project management, business plan development, search for investors and partners.

EDUCATION

- 15.05.2014 **PhD** (Materials Science and Engineering)
Norwegian University of Science and Technology (NTNU)
Synthesis and characterisation of textured lead-free piezoelectric ceramics.
- 26.06.2009 **MSc** (Chemistry- and Biotechnology)
Norwegian University of Science and Technology (NTNU)
Photocatalytic activity of TiO₂-based nanoparticles produced by spray pyrolysis.
- 2007-2008 **Non-Graduating Visiting Student**
University of St. Andrews, Scotland, UK

INTERNATIONAL MOBILITY

- 2018 Three months as a visiting researcher at the University of Tours, France, in the GREMAN research group during my researcher employment in Denmark.
- 2012 Four months as a visiting researcher at the University of Florida, USA, in Jacob L. Jones' research group during my PhD education in Norway.
- 2007-8 One academic year as a student at the University of St Andrews, Scotland, during my MSc education in Norway.

RESEARCH MANAGEMENT

- 2019- Coordinator of the "*Electromechanical Converters*" technology track. This is one of 10 dedicated technologies at DTU Energy, comprising our activities on piezoelectrics and giant electrostrictors. My role is to motivate applications for

research funding, align our research strategies, strengthen our experimental facilities, and ensure collaboration and dissemination of our work both within and outside the department. Currently eight PhD students and postdocs are working exclusively within this technology track, and five permanent academic staff are actively involved.

- 2016-2019 Project leader of three DTU Energy-funded projects on piezoelectrics and oxygen transport membranes (in total ~2 person years)
- 2015-2016 Project leader of “*Ceramic membranes for oxy-fired biomass gasification*”, funded by Energinet.dk. Synthesis of multi-layered tubular oxygen transport membranes and tests in a pilot-scale biomass gasifier (5 person-years).
- 2011 Coordinator of Cerpotech’s research activities within two EU FP7 projects.

RESEARCH FUNDING AND AWARDS

- 2022 “*Microstructurally tailored inverters for distributed energy grids*”, research grant from Independent Research Council Denmark, \$ 400 000
- 2021 “6D ceramics” Young Investigator Grant from VILLUM FONDEN, \$ 1 100 000
- 2019 Co-recipient of “*Hybrid 3D printing of ferroelectric super-structures for electromechanical energy systems*”, industrial PhD grant from Innovation Fund Denmark, \$ 400 000.
- 2019 “*The microplatelet machine*”, Villum Experiment Grant from VILLUM FONDEN, \$ 400 000.
- 2018 Equipment support from H.C. Ørsted Foundation, \$ 20 000.
- 2018 Equipment support from Siemens Foundation, \$ 5 000.
- 2017 Equipment support from Brødrene Hartmann Foundation \$ 10 000.
- 2017 Co-recipient of “*Lead-free piezoelectric ceramics*”, industrial PhD grant from Innovation Fund Denmark, \$ 400 000.
- 2016 “*Microstructurally engineered piezoelectrics for lead-free, high-resolution ultrasound imaging*”, individual postdoc grant from Independent Research Fund Denmark \$ 200 000.
- 2015 Co-recipient of “*Highly Flexible Energy Production by Oxy-Fired Biomass Gasification (HighFlex)*”, granted by ForskEL, \$ 700 000.
- 2010 The Bardal prize for excellent student work within ecological aspects of materials science at NTNU, \$ 1 300.
- 2009 JECS Trust Shaping 4 Student Contest (3rd place), € 100.

COMMITTEE AND VOLUNTEER WORK

- 2020- President, Danish Ceramic Society
- 2017 Initiated mentor program pilot for researchers/assistant profs. at DTU
- 2010-2012 Board member, NTNU NanoLab
- 2008-2009 Board member, Department of Materials Science and Engineering, NTNU
- 2005-2012 Representing NTNU at education fairs, school visits and Researchers Night

Reviewer for: Journal of the American Ceramic Society, Journal of the European Ceramic Society, Ceramics, Journal of the Australian Ceramic Society, Journal of Electroceramics, Ceramics International, Advances in Applied Ceramics, Materials, Crystals, Journal of Alloys and Compounds, Scientific Reports.

Associate editor for: Experimental Results (Cambridge University Press)

PhD opponent for: Nikolai Helth Gaukås (NTNU, 2020), Ahsanul Kabir (DTU, 2020)

CONFERENCE ORGANIZATION AND PARTICIPATION

- I **initiated and organized** “Workshop for electromechanical and dielectric materials and devices” at DTU in 2016.
- **Chair** of the student competition on the 2019 joint ISAF-ICE-EMF-IWPM-PFM conference at EPFL, Lausanne, Switzerland. Judge in the same conference in 2017.
- **Chair** (2017) and **co-chair** (2016) for the session “Materials” at the DTU Sustain conference.

Invited presentations (10):

- 2023 ISAF, Cleveland, Ohio. Young scholar invited talk, tentative title: “*Shape and microstructure control in piezoelectric ceramics*”
- 2022 57th International conference on microelectronics, devices and materials (MIDEM), Maribor, Slovenia. Title: *Textured piezoelectric ceramics for energy harvesting*
- 2021 European Conference on Applications of Polar Dielectrics, Trondheim, Norway. *Ferroelectric response in ceramics with advanced microstructure*. (Cancelled due to covid-19)
- 2020 Electroceramics XVII, online. *Textured lead-free piezoelectric ceramics*.
- 2019 43rd International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, USA. *Tape casting porous and textured lead-free piezoelectrics for ultrasound transducers*.
- 2018 Collaborative Conference on Materials Research (CCMR), Seoul, South Korea. *Textured piezoelectric ceramics*.
- 2018 GREMAN seminar, Tours, France. *Textured ceramics for ultrasound imaging*
- 2017 IDA Mechanical, Aarhus, Denmark. *Ceramic membranes for oxy-blown biomass gasification*.
- 2017 41st International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, USA. *Tubular, multi-layered oxygen transport membranes*.
- 2015 Lead-free ceramics seminar, Trondheim, Norway. *Synthesis and characterization of textured lead-free piezoelectric ceramics*.

SUPERVISION*

- **PhD:**
 - o main supervisor on 1 completed and 2 ongoing projects
 - o co-supervisor on 2 ongoing and 1 completed projects
- **MSc:**
 - o main supervisor on 1 completed and 1 ongoing projects
 - o co-supervisor of 5 completed projects
- **BSc:**
 - o main supervisor on 1 ongoing and 2 completed projects
 - o co-supervisor of 1 completed project

* I have not been qualified to be main supervisor until becoming an associate professor

TEACHING

- Course responsible and lecturer of “Ceramic Science and Engineering”, DTU (2019-)
- Lecturing in the MSc-level course “Functional Materials”, DTU (2015-2017)
- Teaching and establishing general chemistry lab courses, NTNU (2009-2013)
- Teaching assistant in basic chemistry courses, NTNU (2005-2009)

PUBLICATION LIST - ASTRI BJØRNETUN HAUGEN

PUBLICATION METRICS

- 21 peer-reviewed publications, including:
 - 12 as 1st author
 - 9 as corresponding author
 - 4 as last author
 - 1 as single author
- H-index of 11 [Google scholar]
- >480 citations [Google scholar]

PEER-REVIEWED JOURNAL PUBLICATIONS

21. G. Ferrero, K. Astafiev, E. Ringgaard, L.S. de Oliveira, B.R. Sudireddy, **A.B. Haugen**, K. Žiberna, B. Malič, T. Rojac, “Piezoelectric properties of mechanochemically processed 0.67BiFeO₃-0.33BaTiO₃ ceramics,” *J. Eur. Ceram. Soc.*, Oct. 2022.
20. K. Didilis, D. Marani, U. Ditlev, **A.B. Haugen**, and V. Esposito, “Freeform injection molding of functional ceramics by hybrid additive manufacturing,” *Additive Manufacturing*, vol. 60, no. September, 2022.
19. L. M. Aguilera, S. Pirou, P. Khajavi, J. García-Fayos, J.M. Serra, H.L. Frandsen, P.V. Hendriksen, A. Kaiser, R. Kiebach, and **A.B. Haugen**. “Stable, asymmetric, tubular oxygen transport membranes of (Sc₂O₃)_{0.10}(Y₂O₃)_{0.01}(ZrO₂)_{0.89} – LaCr_{0.85}Cu_{0.10}Ni_{0.05}O_{3-δ},” *Open Ceram.*, vol. 11, p. 100292 (2022)
18. R. Kiebach, S. Pirou, L.M. Aguilera, **A.B. Haugen**, A. Kaiser, P.V. Hendriksen, M. Balaguer, J. Garcia-Fayos, J.M. Serra, F. Schulze-Küppers, M. Christie, L. Fischer, W.A. Meulenberg and S. Baumann, “A review on dual-phase oxygen transport membranes: from fundamentals to commercial deployment,” *J. Mater. Chem. A*, **10**, 2152–2195, (2022).
17. C. Gadea, T. Spelta, S.B. Simonsen, V. Esposito, J.R. Bowen, and **A.B. Haugen**, “Hybrid inks for 3D printing of tall BaTiO₃-based ceramics,” *Open Ceram.*, **6** 100110 (2021).
16. **A.B. Haugen**, E. Ringgaard, and F. Levassort, “Textured, lead-free piezoelectric ceramics with high figure of merit for energy harvesting,” *J. Phys. Mater.*, **4** 44002 (2021). **Invited contribution** to special issue “Women’s perspective in Energy Materials”.
15. V.B. Tinti, D. Marani, A. Kabir, **A.B. Haugen**, V. Esposito, and D.Z. de Florio, “Low-temperature synthesis of bismuth titanate by modified citrate amorphous method,” *Ceram. Int.*, **47** [9] 12130–12136 (2021).
14. **A.B. Haugen**, E. Ringgaard and F. Levassort, “Textured multilayered piezoelectric structures for energy conversion”, *JPhys Energy*, **2**, 015002 (2019). **Invited contribution** to special issue “Emerging Leaders”.

13. **A.B. Haugen**, “Hybrid atmosphere processing of sodium potassium niobate-based ceramics”, *Ceramics* **2** [3] 460-471 (2019).
12. **A.B. Haugen**, L.M. Aguilera, K. Kwok, T. Molla, K.B. Andersen, S. Pirou, A. Kaiser, P.V. Hendriksen and R. Kiebach, “Exploring the Processing of Tubular Chromite- and Zirconia-Based Oxygen Transport Membranes”, *Ceramics*, **1** [2], 229-245 (2018).
11. H. Simons, **A.B. Haugen**, A.C. Jakobsen, S. Schmidt, F. Stöhr, M. Majkut, C. Detlefs, J.E. Daniels, D. Damjanovic and H.F. Poulsen, “Long-range symmetry breaking in embedded ferroelectrics”, *Nature Materials*, **17**, 814–819 (2018).
10. **A.B. Haugen**, A. Geffroy, A. Kaiser, and V. Gil, “MgO as a non-pyrolyzable pore former in porous membrane supports,” *Journal of the European Ceramic Society*, **38**, 3279–3285 (2018).
9. J.C. Grivel, K. Thydén, J.R. Bowen, and **A.B. Haugen**, “Deposition of highly oriented (K,Na)NbO₃ films on flexible metal substrates,” *Thin Solid Films*, **650** 7–10 (2018).
8. **A.B. Haugen**, J. Gurauskis, A. Kaiser, and M. Søgaard, “Graphite and PMMA as pore formers for thermoplastic extrusion of porous 3Y-TZP oxygen transport membrane supports,” *Journal of the European Ceramic Society*, **37** [3] 1039–1047 (2017).
7. S. Ovtar, J. Gurauskis, **A.B. Haugen**, C. Chatzichristodoulou, A. Kaiser, and P.V. Hendriksen, “Oxygen transport properties of tubular Ce_{0.9}Gd_{0.1}O_{1.95}-La_{0.6}Sr_{0.4}FeO_{3-d} composite asymmetric oxygen permeation membranes supported on magnesium oxide,” *Journal of Membrane Science*, **523** 576–587 (2017).
6. **A.B. Haugen**, F. Madaro, L.-P. Bjørkeng, T. Grande, and M.-A. Einarsrud, “Sintering of sub-micron K_{0.5}Na_{0.5}NbO₃ powders fabricated by spray pyrolysis,” *Journal of the European Ceramic Society*, **35** [5] 1449–1457 (2015).
5. **A.B. Haugen**, G.H. Olsen, F. Madaro, M.I. Morozov, G. Tutuncu, J.L. Jones, T. Grande, and M.-A. Einarsrud, “Piezoelectric K_{0.5}Na_{0.5}NbO₃ ceramics textured using needlelike K_{0.5}Na_{0.5}NbO₃ templates,” *Journal of the American Ceramic Society*, **97** [12] (2014).
4. **A.B. Haugen**, M.I. Morozov, M. Johnsson, T. Grande, and M.-A. Einarsrud, “Effect of crystallographic orientation in textured Ba_{0.92}Ca_{0.08}TiO₃ piezoelectric ceramics,” *Journal of Applied Physics*, **116** [13] (2014).
3. **A.B. Haugen**, M.I. Morozov, J.L. Jones, and M.-A. Einarsrud, “Rayleigh analysis of dielectric properties in textured K_{0.5}Na_{0.5}NbO₃ ceramics,” *Journal of Applied Physics*, **116** [21] 214101 (2014).
2. **A.B. Haugen**, J.S. Forrester, D. Damjanovic, B. Li, K.J. Bowman and J.L. Jones “Structure and phase transitions in 0.5(Ba_{0.7}Ca_{0.3}TiO₃)-0.5(BaZr_{0.2}Ti_{0.8}O₃) from –100 °C to 150 °C,” *Journal of Applied Physics*, **113** [1] 14103 (2013).

1. **A.B. Haugen**, I. Kumakiri, C. Simon, and M.A. Einarsrud, “TiO₂, TiO₂/Ag and TiO₂/Au photocatalysts prepared by spray pyrolysis,” *Journal of the European Ceramic Society*, **31** [3] 291–298 (2011).

MONOGRAPHS

1. **A.B. Haugen**, *Synthesis and characterisation of textured lead-free piezoelectric ceramics*, PhD Thesis at NTNU (2014).