Curriculum Vitae – Ulrik Lund Andersen

PERSONAL INFORMATION

Name: Andersen, Ulrik Lund
Date of birth: 30.07.1972
Research ID: A-5965-2011
Nationality: Danish
ORCID: 0000-0002-1990-7687
Children: 2 (2002, 2004)
URL for web site: http://www.fysik.dtu.dk/english/research/qpit

EDUCATION

2003	PhD in Applied Physics, Department of Physics, Technical University of Denmark (DTU), Denmark
1999	MSc in Applied Physics, Department of Physics, Technical University of Denmark (DTU), Denmark

CURRENT POSITION(S)

2012 –	Professor, Head of section *Quantum Physics and Information Technology* (QPIT), Department of Physics, Technical University of Denmark (DTU), Denmark
2018 –	Director of DNRF Center of Excellence on Macroscopic Quantum States (bigQ)
2022 –	Technical advisor & co-founder, Alea Quantum Technologies Aps
2024 –	Co-director of NNF Center for Biomedical Quantum Sensing
2024 –	Technical advisor & co-founder, DiaSense Aps
2024 –	CEO & co-founder, Celare Quantum Communications Aps

PREVIOUS POSITIONS

2017 – 2022	Director of Quantum DTU, Denmark
2016 – 2018	Scientific Director of Quantum Innovation Center (QUBIZ), Denmark
2006 – 2019	Guest Professor, Max-Planck Institute for the Science of Light, Erlangen, Germany
2011 – 2015	Guest Professor, SAOT Erlangen graduate school in advanced optical technologies, Germany
2006 – 2011	Associate Professor, Department of Physics, Technical University of Denmark (DTU), Denmark
2003 – 2010	Group leader *Quantum information processing group*, Friedrich-Alexander-Universität Erlangen-Nürnberg & Max-Planck Research group, Germany
2003 – 2003	Postdoctoral Fellow, Institute for Optics, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

RESEARCH AREA

The research and innovation of U.L. Andersen revolves broadly around Quantum information science and quantum technology with special focus on quantum sensing, quantum communication, quantum computing and fundamental quantum optics. The experimental platforms include continuous variable quantum optics, optomechanics and color centers in diamond.

AWARDS

2023	ERC Advanced grant award
2015	Sapere Aude award – Top Researcher, The Independent Research Fund Denmark
2013	Eliteforsk award from the Ministry of Education and Research
2011	Sapere Aude award – Scientific Leader, The Independent Research Fund Denmark
2008	Sapere Aude award – Young Researcher, The Independent Research Fund Denmark
2005	DOPS prize of the Danish Optical Society, Denmark
2003	Alexander von Humboldt fellowship for research, Universität Erlangen-Nürnberg, Germany

PUBLICATIONS
Number of peer-reviewed journal publications: 212
Number of citations: 9071 (WoS) 14333 (Google Scholar)
H-index: 50 (WoS) 61 (Google Scholar)
Other publications: 8 book chapters, 10 full proceedings papers and >200 conference abstracts

FIVE SELECTED PUBLICATIONS

1. Practical continuous-variable quantum key distribution with composable security
   N Jain, HM Chin, H Mani, C Lupo, DS Nikolic, A Kordts, S Pirandola, UL Andersen, Thomas Brochmann Pedersen, Matthias Kolb, Bernhard Ömer, Christoph Pacher, Tobias Gehring, Ulrik L Andersen
   Nature communications 13 (1), 4740 (2022).
2. Deterministic multi-mode gates on a scalable photonic quantum computing platform,
   MV Larsen, X Guo, CR Breum, JS Neergaard-Nielsen, UL Andersen.
   Nature Physics, 17, 1018 (2021)
3. Distributed quantum sensing in a continuous-variable entangled network,
   Guo, Xueshi; Breum, Casper; Borregaard, Johannes; Izumi, Shuro; Larsen, Mikkel; Gehring, Tobias; Christandl, Matthias, Neergaard-Nielsen, Jonas; Andersen, Ulrik L.
   Nature Physics 16, 28 (2020)
4. Deterministic generation of a two-dimensional cluster state, Larsen, Mikkel; Guo, Xueshi; Breum, Casper; Neergaard-Nielsen, Jonas S.; Andersen, Ulrik L. Science 366, 369 (2019).
5. High-rate measurement-device-independent quantum cryptography, Nature Photonics (2015) Volume 9, Issue 6, pp. 397-402
   Pirandola, Stefano; Ottaviani, Carlo; Spedalieri, Gaetana; Weedbrook, Christian; Braunstein, Samuel L.; Lloyd, Seth; Gehring, Tobias; Jacobsen, Christian Scheffmann; Andersen, Ulrik Lund.

SUPERVISION
Since 2007: 37 Postdocs, 38 PhD and 30 Master Students at the Department of Physics, DTU.

TEACHING ACTIVITIES

2021 –	MSc course: Quantum Information Technology, 5 ECTS (10385), DTU, main responsible
2021 –	MSc course: Quantum Mechanics, 10 ECTS (10102), DTU, main responsible
2014 – 2018	MSc course: Quantum information, 5 ECTS (10384), DTU, main responsible
2010 – 2017	MSc course: Quantum Optics, 10 ECTS (10380), DTU, main responsible
2006 – 2016	MSc course: Advanced Quantum Mechanics, 10 ECTS (10112), DTU, main responsible
2006 – 2010	BSc course: Optics, 10 ECTS, DTU, main responsible
2019 – 2022	PhD course: QuantumDTU Summer School on Quantum Technology 2019, 5 ECTS (10550), main responsible
2008 – 2017	PhD course: Quantum- and Nonlinear Optics (summer school), 5 ECTS (10502), DTU, main responsible
2013 –	PhD course: Journal club in Quantum Optics, 7,5 ECTS (10512), DTU, main responsible

PATENTING & INNOVATION

- Co-founder of start-ups: Alea Quantum Technologies Aps, DiaSense Aps & Celare Quantum Communications
- Industry collaborations: NKT Photonics, Cryptomathics, Zybersafe, Danske Bank, KPMG, KMD, Unisensor, AMCS, MQS, Xanadu, Q.Ant, Dencrypt, Partisia
- Issued patents & patent applications
  1. ”Squeezed light generator and methods for generating squeezed light”, U.L. Andersen, C. Scheffmann and T. Gehring, WO2019120418
  2. “A magnetometer using optically active defects in a solid state material”, U.L. Andersen, A. Huck, H.A.R. El-Ella, S. Ahmadi, WO2019002576
  3. “A Quantum Random Number Generator” T. Gehring, U.L. Andersen, WO2021094606
  4. “Measurement Based Photonic Quantum Computing System” M. Larsen, J. Neergaard-Nielsen, U.L. Andersen, Patent application
  5. “Density-modulated phononic membranes” D. Høj, U. B. Hoff, U.L. Andersen, Patent application
  6. “Measurement Based Gaussian Boson Sampling” J. Hastrup, J. Neergaard-Nielsen, A. Verma, U.L. Andersen

ORGANISATION OF SCIENTIFIC INTERNATIONAL MEETINGS

2023 Organizer, Workshop on Gaussian and non-Gaussian Quantum Correlations, BLOX, Copenhagen, Denmark, 100 Participants

2022 Organizer, Workshop on Continuous Variable Photonics Quantum Computing, Scandic Hotel Frederiksberg, Denmark, 100 Participants

2022 Organizer, Workshop on Continuous-Variable Quantum Correlations, Carlsberg Academy, Denmark, 70 Participants

2022 Organizer, International symposium on Quantum Information Science, Carlsberg Academy, Denmark, 80 participants

2021 Organizer, International PhD winter school on NonGaussian physics (NONGAUSS), Tivoli hotel, Denmark, 60 participants

2019 Organizer, International PhD Summer schools on Quantum Technology, Denmark, 35 participants

2017 Organizer, 24th Central European Workshop on Quantum Optics (CEWQO 2017), Denmark, 250 participants

2017 Organizer, International PhD Summer schools on Quantum and Nonlinear optics (QNLO 2017), Denmark, 60 participants

2016 Organizer, International Wilhelm & Else Heraeus seminar on “Quantum Limited Metrology and Sensing”, Bad Honnef, Germany, 65 participants

2016 Organizer, 2nd international workshop on “Trustworthy Quantum Information (TQI´2016)”, Shanghai, China, 100 participants

2016 Organizer, International Wilhelm & Else Heraeus seminar on “Macroscopic Quantum Entanglement”, Bad Honnef, Germany, 65 participants

2015 Organizer, International PhD Summer schools on Quantum and Nonlinear optics (QNLO 2015), Denmark, 60 participants.

2015 Organizer, 2nd International Workshop on Macroscopic Quantum Coherence (MQC 2015), Scotland, 60 participants

2014 Organizer, 1st International Workshop on Macroscopic Quantum Coherence (MQC 2014), Denmark, 50 participants

2012 Organizer; International PhD Summer schools on Quantum and Nonlinear optics (QNLO 2012), Denmark, DK, 60 participants

2010 Organizer, International PhD Summer schools on Quantum and Nonlinear optics (QNLO 2010), Denmark, 60 participants

2010 Organizer, 9th International workshop on Continuous Variable Quantum Information

Processing, (CVQIP 2010), Denmark, 50 participants

2008 Organizer, International PhD Summer schools on Quantum and Nonlinear optics (QNLO 2008), Hven, Sweden, 50 participants

INSTITUTIONAL RESPONSIBILITIES

2011 – Section head, Quantum Physics and Information Technology (QPIT), Department of Physics, Technical University of Denmark, Denmark

2006 – Faculty member, Department of Physics, Technical University of Denmark, Denmark

COMMISSIONS OF TRUST

2024 – Member of Danish National Forum for Quantum Technologies under the Danish Government

2024 – Member of ERC evaluation panel

2023 – Member of the Danish Academy of Technical Sciences (ATV)

2023 – Associate Editor of the Journal "Optica Quantum"

2023 – Member of the Quantum Coordination Board (QCB) under the Quantum Technology Flagship program

2018 – Member of the European Quantum Community Network (QCN) under the Quantum Technology Flagship program

2016 – Member of the

2011 –2016 Program committee of CLEO'23, ICSSUR'23, QCrypt'2019, QCrypt'2016, TyQI'2017 and a number of SPIE conferences, e.g. "Quantum Optics and Quantum Information Transfer and Processing", SPIE Optics meeting, Prague, Czech Republic, April 2011, 2013 and 2015

2011 – Editor of journal on "Quantum Measurements and Quantum metrology", Versita, Italy

2006 – Evaluator for several foundations: European Research Council (ERC); Australian Research Council (ARC); Scientific Council of the Italian (CNISM); Belgium FNRS Fonds de la Rescherche Scientifique; the Canadian Natural Resources and Applied Sciences (NRAS); the Czech Science Foundation; Der Wissenschaftsfonds, Austria; Keck foundation (USA); Knut and Alice Wallenberg Foundation (Sweden); German Research Foundation (DFG) and others.

2003 – Peer reviewer for several high ranked international journals, i.e. Science & Nature.

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2006 – Member, Research Network "*European Physical Society*" (EPS)

2006 – Member, Research Network "*Optical Society of America*" (Optica)

MAJOR COLLABORATIONS

- Professor Radim Filip, Quantum information theory, Department of Optics Faculty of Science, Palacky University, Czech Republic
- Professor Timothy Ralph, Quantum information theory and optomechanics, Faculty of Science, University of Queensland, Australia
- Professor Warwick Bowen, Quantum information theory and optomechanics, Faculty of Science, University of Queensland, Australia
- Prof. Dr. Gerd Leuchs, Quantum science and quantum technology, Max Planck Institute for the Science of Light, Germany
- Assoc. Prof. Christoph Marquardt, Max Planck Institute for the Science of Light, Germany
- Professor Akira Furusawa, Continuous variable quantum information, Department of Applied Physics, University of Tokyo, Japan

- Director Masahiro Takeoka, Measurement theory, Quantum ICT Advanced Development Center, National Institute of Information and Communications Technology (NICT), Japan
- Senior Researcher Maria Chekhova, Quantum optics, Department of Physics, M.V. Lomonosov Moscow State University, Russia
- Professor Matteo G A Paris, Quantum sensing, Applied Quantum Mechanics, Dipartimento di Fisica, Universita`degli Studi di Milano, Italy
- Professor Stefano Pirandola, Quantum key distribution, Department of Computer Science, University of York, United Kingdom
- Senior Scientist Christoph Pacher, Quantum key distribution, Center for Digital Safety & Security, The AIT Austrian Institute of Technology, Austria
- Professor Ole Sigmund, Department of Mechanical Engineering, Denmark, DTU
- Professor Darko Zibar, Department of Photonics Engineering, Denmark, DTU
- Professor Antonio Acin, The Institute of Photonics Sciences (ICFO), Spain
- Assoc. Professor Cosmo Lupo, Politecnico di Bari, Italy
- Professor Peter van Loock, Mainz University, Germany