

Curriculum vitae

Søren Eilers

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Career:

- Education
 - M.S., Mathematics, computer science, University of Copenhagen, **93**
 - PhD, Mathematics, University of Copenhagen, **95**.
- Positions:
 - Assistant professor **96–99**, University of Copenhagen.
 - Associate professor **99–08**, University of Copenhagen.
 - Professor **08–**, University of Copenhagen.
- International experience:
 - University of California at Santa Barbara **91–92** [10 months]
 - Universidade de São Paulo **94** [2 months]
 - The Fields Institute for Research in Mathematical Sciences **94–95** [11 months]
 - Purdue University **98** [5 months]
 - University of New Mexico **98** [5 months]
 - Mathematical Sciences Research Institute **00** [3 months]
 - Institut Mittag-Leffler **03–04** [2 months]
 - The Fields Institute for Research in Mathematical Sciences **07** [2 months]
 - Lund University **12–13** [2 months]
 - Institut Mittag-Leffler **16** [4 months]

Scientific leadership:

- Supervision:
 - 33 M.S. theses.
 - PhD students:
 - * T.M. Carlsen, PhD, **04** [Current position: Professor]
 - * G. Restorff, PhD, **08** [Current position: Professor]
 - * R. Johansen PhD, **11** [Current position: Senior advanced analytics architect]
 - * S.E. Arklint, PhD, **12** [Current position: Academic officer]
 - * A.P.W. Sørensen, PhD, **12** [Current position: Strategic data analyst]

- * R. Bentmann, PhD, **13** [Current position: Senior consultant]
- * J. Gabe, PhD, **15** [Current position: Assistant professor]
- * K. Brix, PhD, **19** [Current position: Postdoc]
- * Current: A. Frei **19–22**.
- o Postdoctoral:
 - * A. Toms, Canadian National Research Council postdoc fellow, **03–04**.
 - * K. Medynets, INTAS fellow, **07**.
 - * T. Katsura, Japan Society for the Promotion of Science senior fellow, **10–11**.
 - * J. Öinert, Vetenskapsrådet fellow, **10–12**.
 - * S. Yamashita, Japan Society for the Promotion of Science junior fellow, **10–11**.
 - * A. Muñoz, NSF/DNRF GROW fellow, **15–16**.
 - * A. Dor-On, ERC Marie Skłodowska-Curie individual fellow, **19–21**.
- President, Danish Mathematical Society **06–08**.
- Associate chair for education, University of Copenhagen, **07–11**
- NordForsk Researcher Network: Operator algebras and dynamics, Principal Investigator, **09–12**.
[Infrastructure for network of 8 nodes with 50 mathematicians]
- Principal investigator: *Experimental mathematics in number theory, operator algebras, and topology*. Villum Fonden **12–16**
[9 postdoc years & infrastructure]
- Main organizer: *Classification of operator algebras: complexity, rigidity, and dynamics*. Mittag-Leffler Institute program **16**.

Editorial:

- Mathematica Scandinavica (Editor) **13–19**
- Journal of Mathematical Analysis and Applications (Associate editor) **17–20**
- Pure and applied mathematics, Elsevier (Editorial board) **15–17**
- (with T.M. Carlsen, G. Restorff and S. Silvestrov) Operator Algebra and Dynamics, Springer Proceedings in Mathematics & Statistics **58** (2013)
- (with D. Olesen) Gert K. Pedersen, C^* -algebras and their Automorphism Groups, second edition. Elsevier 2018.

Publications [Cited 546 times by 244 authors, h -index=12]

- [1] A complete invariant for AD algebras with real rank zero and bounded torsion in K_1 . *Journal of Functional Analysis* **139** (1996), 325–348.

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- [2] Künneth splittings and classification of C^* -algebras with finitely many ideals. *Fields Institute Communications Series* **13**, "Operator Algebras and their Applications", 81–90, American Mathematical Society, 1997.
 - [3] Morita equivalence for crossed products by Hilbert C^* -bimodules (with B. Abadie and R. Exel). *Transactions of the American Mathematical Society* **350** (1998), 3043–3054.
 - [4] Quasidiagonal extensions and AF algebras (with T.A. Loring and G.K. Pedersen). *Mathematische Annalen* **311** (1998), 233–249.
 - [5] Stability of anticommutation relations. An application of noncommutative CW complexes (with T.A. Loring and G.K. Pedersen). *Journal für die reine und angewandte Mathematik* **499** (1998), 101–143.
 - [6] Compressing coefficients while preserving ideals in the K -theory for C^* -algebras (with M. Dădărlat). *K-Theory* **14** (1998), 281–304.
 - [7] Noncommutative end theory (with C. A. Akemann). *Pacific Journal of Mathematics* **185** (1998), 47–88
 - [8] Approximate homogeneity is not a local property (with M. Dădărlat). *Journal für die reine und angewandte Mathematik* **507** (1999), 1–14.
 - [9] Fragility for subhomogeneous C^* -algebras with one-dimensional spectrum (with T.A. Loring and G.K. Pedersen). *Bulletin of the London Mathematical Society* **31** (1999), 337–344.
 - [10] Connectivity and components for C^* -algebras. *Mathematica Scandinavica* **84** (1999), 119–136.
 - [11] Computing contingencies for stable relations (with T.A. Loring). *International Journal of Mathematics* **10** (1999), 301–326.
 - [12] The Bockstein map is necessary (with M. Dădărlat). *Canadian Mathematical Bulletin* **42** (1999), 274–284.
 - [13] Morphisms of extensions of C^* -algebras: Pushing forward the Busby invariant (with T.A. Loring and G.K. Pedersen). *Advances in Mathematics*, **147** (1999), 74–109.
 - [14] Asymptotic unitary equivalence in KK -theory (with M. Dădărlat). *K-Theory* **23** (2001), 305–322.
 - [15] Approximate homogeneity of C^* -algebras with finitely many ideals. *Proceedings of the Royal Irish Society* **101A** (2001), 149–162.
 - [16] Finite dimensional representations of the soft torus (with R. Exel). *Proceedings of the American Mathematical Society* **130** (2002), 727–731.
 - [17] On the classification of nuclear C^* -algebras (with M. Dădărlat). *Proceedings of the London Mathematical Society* **85** (2002), 168–210

- [18] Regularity of projections revisited (with C.A. Akemann). *Journal of Operator Theory* **48** (2002), 515–534.
- [19] Riesz properties of K -groups associated to C^* -algebras of minimal ranks (with G.A. Elliott). *Comptes Rendus Mathématiques de l'Académie des Sciences (La Société Royale du Canada)* **25** (2003), 108–113.
- [20] Augmenting dimension group invariants for substitutional dynamical systems (with T.M. Carlsen). *Ergodic Theory & Dynamical Systems* **24** (2004), 1015–1039.
- [21] Matsumoto K -groups associated to certain shift spaces (with T.M. Carlsen). *Documenta Mathematica* **9** (2004), 639–671.
- [22] C^* -algebras associated to symbolic dynamics. *Discrete and Continuous Dynamical Systems* **15** (2006) 177–192.
- [23] Ordered K -groups associated to substitutional dynamics (with T.M. Carlsen). *Journal of Functional Analysis* **38** (2006), 99–117.
- [24] On Rørdam's classification of certain C^* -algebras with one nontrivial ideal (with G. Restorff) In "Operator algebras: The Abel symposium 2004", Abel Symposia **1** (2006), 87–96.
- [25] Dimension groups associated to β -expansions (with T. Bates and T.M. Carlsen). *Mathematica Scandinavica* **100** (2007), 198–208.
- [26] A graph approach to computing nondeterminacy in substitutional dynamical systems (with T.M. Carlsen). *RAIRO - Theoretical Informatics and Applications* **41** (2007), 285–306.
- [27] Inductive limits of K -theoretic complexes with torsion coefficients (with A. Toms). *Journal of K -theory* **1** (2008), 145–168.
- [28] Classification of extensions of classifiable C^* -algebras (with G. Restorff and E. Ruiz). *Advances in Mathematics* **222** (2009), 2153–2172.
- [29] On the classification of nonsimple graph C^* -algebras (with M. Tomforde). *Mathematische Annalen* **346** (2010), 393–418.
- [30] On graph C^* -algebras with a linear ideal lattice (with G. Restorff and E. Ruiz). *Bulletin of the Malaysian Mathematical Sciences Society* (2) **33** (2010), 233–241.
- [31] Enumeration of pyramids of one-dimensional pieces of arbitrary fixed integer length (with B. Durhuus). *Discrete Mathematics and Theoretical Computer Science* proc. **AM** (2010), 145–160.
- [32] Nonsplitting in Kirchberg's ideal-related KK -theory. (with G. Restorff and E. Ruiz). *Canadian Mathematical Bulletin* **54** (2011), 68–81.
- [33] On the asymptotic enumeration of LEGO[®] structures (with M. Abrahamsen). *Journal of Experimental Mathematics*, **20** (2011), 145–152.

- [34] Reducibility of covers of AFT shifts (with T. Bates and D. Pask). *Israel Journal of Mathematics* **185** (2011), 207–234.
- [35] On some new invariants for strong shift equivalence for shifts of finite type (with I. Kiming). *Journal of Number Theory* **132** (2012), 502–510.
- [36] Index maps in the K -theory of graph algebras (with T.M. Carlsen and M. Tomforde). *Journal of K -theory* **9** (2012), 385–406.
- [37] Amplified graph C^* -algebras (with E. Ruiz and A. Sørensen). *Münster Journal of Mathematics* **5** (2012), 121–150.
- [38] Classifying C^* -algebras with both finite and infinite subquotients (with G. Restorff and E. Ruiz). *Journal of Functional Analysis* **265** (2013), 449–468.
- [39] Classification of graph C^* -algebras with no more than four primitive ideals (with G. Restorff and E. Ruiz). *Operator Algebra and Dynamics, Springer Proceedings in Mathematics & Statistics* **58** (2013) 89–129.
- [40] The ordered K -theory of a full extension (with G. Restorff and E. Ruiz). *Canadian Journal of Mathematics* **66** (2014), 596–624.
- [41] Identifying AF-algebras that are graph C^* -algebras (with T. Katsura, E. Ruiz, M. Tomforde). *Journal of Functional Analysis* **266** (2014), 3968–3996.
- [42] On the entropy of LEGO[®] (with B. Durhuus). *Journal of Applied Mathematics and Computing* **45** (2014) 433–448.
- [43] The ranges of K -theoretic invariants for nonsimple graph algebras (with T. Katsura, M. Tomforde and J. West). *Transactions of the American Mathematical Society* **368** (2016), 3811–3847.
- [44] Corrigendum to "Classifying C^* -algebras with both finite and infinite subquotients" [J. Funct. Anal. 265 (2013) 449–468] (with G. Restorff and E. Ruiz). *Journal of Functional Analysis* **270** (2016), 854–859.
- [45] The LEGO counting problem. *American Mathematical Monthly* **123** (2016), 415–426. **[Cover story]**
- [46] The isomorphism problem for semigroup C^* -algebras of right-angled Artin monoids (with X. Li and E. Ruiz). *Documenta Mathematica* **21** (2016), 309–343.
- [47] Ideal related K -theory with coefficients (with G. Restorff and E. Ruiz). *Houston Journal of Mathematics* **43** (2017), 403–458.
- [48] Semiprojectivity and properly infinite projections in graph C^* -algebras (with T. Katsura). *Advances in Mathematics* **317** (2017), 108–156.
- [49] Flow equivalence and isotopy for subshifts (with M.M. Boyle and T.M. Carlsen). *Dynamical Systems* **32** (2017), 305–325.

- [50] Invariance of the Cuntz splice (with G. Restorff, E. Ruiz and A.P.W. Sørensen). *Mathematische Annalen* **369** (2017) 1061–1080.
- [51] Flow equivalence of sofic shifts (with M.M. Boyle and T.M. Carlsen). *Israel Journal of Mathematics* **225** (2018), 111–146.
- [52] Filtered K -theory for graph algebras (with G. Restorff, E. Ruiz and A.P.W. Sørensen). In: Wood D., de Gier J., Praeger C., Tao T. (eds) 2016 MATRIX Annals, pp. 229–249. MATRIX Book Series, vol 1. Springer, 2018.
- [53] Geometric classification of graph C^* -algebras over finite graphs (with G. Restorff, E. Ruiz and A.P.W. Sørensen). *Canadian Journal of Mathematics* **70** (2018), 294–353.
- [54] Automorphisms of Cuntz-Krieger algebras (with G. Restorff and E. Ruiz). *Journal of Noncommutative Geometry* **12** (2018) 217–254.
- [55] A dynamical characterization of diagonal preserving $*$ -isomorphisms of graph C^* -algebras (with S.E. Arklint and E. Ruiz). *Ergodic Theory and Dynamical Systems* **38** (2018), 2401–2421.
- [56] Flow equivalence and orbit equivalence for shifts of finite type and isomorphism of their groupoids (with T.M. Carlsen, E. Ortega and G. Restorff). *Journal of Mathematical Analysis and Applications* **469** (2019), 1088–1110.
- [57] Flow equivalence of G -SFTs (with M.M. Boyle and T.M. Carlsen). *Transactions of the American Mathematical Society* **373** (2020), 2591–2657.
- [58] The extension problem for graph C^* -algebras (with J. Gabe, T. Katsura, E. Ruiz and M. Tomforde). *Annals of K -theory* **5** (2020), 295–315.
- [59] C^* -stability of discrete groups (with T. Shulman and A.P.W. Sørensen). *Advances in Mathematics* **373** (2020), in press.
- [60] Classification of irreversible and reversible Pimsner operator algebras (with A. Dor-On and S. Geffen). To appear in *Compositio Mathematica*.
- [61] The complete classification of unital graph C^* -algebras: Geometric and strong (with G. Restorff, E. Ruiz and A.P.W. Sørensen). To appear in *Duke Mathematical Journal*.

Expository:

- Indledende matematisk analyse [Introductory analysis], with E. Hansen and T.G. Madsen, 1st-11th edition **10–20**
- Introduction to experimental mathematics, with R. Johansen, Cambridge University Press, **17**
- Symbolic Dynamics (with M.-P. Béal, J. Berstel, and D. Perrin). Chapter for “Handbook in Automata Theory”, European Mathematical Society Publishing House, in press.

Conference talks 2015– [of 81 since 1994]: (● = invited, ○ = contributed)

- **01/15**: Operator Algebras and Their Applications: A Tribute to Richard V. Kadison, AMS-MAA Joint meeting, San Antonio, USA.
- **05/15**: Classification of C^* -Algebras, Flow Equivalence of Shift Spaces, and Graph and Leavitt Path Algebras, Lafayette, USA [**Plenary lecture series**].
- **05/15**: Great Plains Operator Theory Seminar, Purdue University, USA [**Plenary**].
- **07/15**: Focus Programme on C^* -algebras, Münster, Germany [**Oberseminar talk**].
- **08/15**: The Abel Symposium, Hurtigruten Cruiseships, Norway.
- **11/15**: Norwegian operator algebras meeting, Trondheim, Norway [**Main speaker**].
- **04/16**: Edinburgh Mathematical Society, Aberdeen.
- **07/16**: Groups, Dynamics, and Operator Algebras, Queen Mary University, London, England.
- **08/16**: C^* -Algebras, Oberwolfach, Germany.
- **11/16**: Structure and Classification of C^* -algebras, IMPAN, Poland [**Featured talk**]
- **6/17**: Barcelona conference on C^* -algebras: Structure, classification and dynamics. CRM, Barcelona, Spain.
- **6/17**: Special week on operator algebras, East China Normal University, Shanghai, China.
- **7/17**: Applications of Model Theory to Operator Algebras, University of Houston, USA.
- **10/17**: Applications of the UCT for C^* -algebras, University of Copenhagen.
- **1/18**: New Geometry of Quantum Dynamics, IMPAN, Poland.
- **5/18**: Workshop in operator algebras and dynamics on the Faroe Islands, Tórshavn, Faroe Islands.
- **7/18**: ICM Operator Algebras Satellite, Florianopolis, Brazil

Conference organization 2010– [of 34 since 2000]:

- Organizer (with T.A. Loring and T. Shulman), *Semiprojectivity and asymptotic morphisms*. University of Copenhagen, **05/10**.
- Organizer (with M. Dadarlat, G.A. Elliott, M. Rørdam, and A. Toms), *Classification of C^* -algebras*. Banff International Research Station, Alberta, Canada, **9/10**.
- Organizer (with S. Silvestrov and L. Turowska), *Operator algebras, dynamics, applications*. AGMP-10, Tjärnö, Sweden, **10/10**.

- Organizer (with T.M. Carlsen), *NordForsk Network Junior Conference*. University of Copenhagen, **09/11**.
- Organizer (with T.M. Carlsen and G. Restorff), *NordForsk Network Closing Conference*. Faroe Islands, **05/12**.
- Organizer (with H. Thiel and A.P.W. Sørensen), *Semiprojectivity*, master class, University of Copenhagen, **09/12**.
- Organizer (with T.A. Loring), *Semiprojective C^* -algebras*, workshop, University of Copenhagen, **09/12**.
- Organizer (with G. Abrams, G. Elliott, M. Laca, M. Tomforde), *Graph algebras: Bridges between graph C^* -algebras and Leavitt path algebras*. Banff International Research Station, **04/13**.
- Organizer of special session “Classification of operator algebras: complexity, rigidity, and dynamics” at *26th Nordic Congress of Mathematicians*, Lund **6/13**.
- Organizer (with E. Ruiz) *Flow equivalence of graphs, shifts, and C^* -algebras*, workshop, University of Copenhagen, **11/13**.
- Organizer (with T.M. Carlsen) *Danish-Norwegian Operator Algebra Workshop*, Copenhagen, **12/13**.
- Organizer (with E. Bedos) *Danish-Norwegian Operator Algebra Workshop*, Lysebu, **12/14**.
- Organizer (with R. Nest and S. White) *Conference on Operator Algebras and Applications – in celebration of Erik Christensen and his work*, University of Copenhagen, **05/15**.
- Program committee member *Mathematics of Automata*, Leipzig, **05/15**.
- Organizer (with F. Lutz) “Experimental mathematics”, minisymposium at *Deutsche Mathematiker-Verein Jahrestagung*, Hamburg, **09/15**.
- Program committee (with M. Dadarlat, N.C. Phillips, A. Sims), “Classification and discrete structures”, Institut Mittag-Leffler workshop **01/16**.
- Organizer (with S.E. Arklint and K. Brix), “Rigidity of C^* -algebras associated to dynamics”, University of Copenhagen, **10/17**.
- Organizer (with J. Ramagge) “Computation and experiments in operator algebra and dynamics with Magma”, micro-workshop, University of Copenhagen, **10/19**.
- Steering committee member, Young Mathematicians in C^* -algebras (YMC*A), **19–**
- Organizer (with O. Becker and T. Shulman), “Stability in Group Theory and Operator Algebras”, workshop, University of Copenhagen, **12/19**.
- Organizer (with A. Dor-On, J. KAAD, D. Kyed) “Automorphisms and invariants for operator algebras”, conference, University of Copenhagen, **10/21**.

Larger grants and stipends (as PI):

- **94** Valdemar Andersens rejselegat for matematikere. (279 kkr)
- **97** The Carlsberg Foundation. (174 kkr)
- **99** Danish Centre for Science Education. (127 kkr)
- **05** The Faroese Research Council (with G. Restorff). (519 kkr)
- **09** NordForsk: Researcher Network: Operator algebras and dynamics. (800 kkr)
- **12** VILLUM Foundation: Experimental Mathematics in Number Theory, Topology and Operator Algebras. (5743 kkr)

Other formalized research group memberships:

- Operator algebras in Denmark, Independent Danish Research Foundation. Member **03–15**
- *AutoMathA*, European Science Foundation program “Automata from mathematics to applications”, steering committee member, **05–10**
- Marie Curie Research Training Network “Conformal Structure and Dynamics”, Denmark/Sweden team, associated researcher, **07-12**
- INTAS South Caucasian republics program “K-theory, non-commutative geometry, homology theories, homotopy theory, operator and normed algebras”, Copenhagen team, member **07-09**
- Symmetry and Deformation, University of Copenhagen Excellence and Danish Fundamental Science Foundation Center, permanent member **08-19**
- NordForsk Researcher Network: Operator algebras and dynamics, prime investigator, **09-12**.
- Experimental Mathematics in Number Theory, Topology and Operator Algebras. prime investigator, **12-16**.
- Quantum dynamics, Horizon 2020 RISE program. Member and work package coordinator. **15-20**
- Automorphisms and invariants for operator algebras, Independent Danish Research Foundation. Member and node coordinator. **18-22**

Evaluation:

- PhD evaluation committees: Copenhagen (chairman) **09,12,13,17,17,17,20**, Århus University **03,10**, Oslo University **06**, University of Lund **05,09,09**, University of Southern Denmark **09,11**.
- **06**: Habilitation evaluation, Westfälische Wilhelms-Universität Münster.
- **10**: Hiring committee, university lecturer, University of Lund.

- **10**: Hiring committee, associate professor, Århus University.
- **15**: Advisory hiring committee, associate dean for education, Faculty of Science, University of Copenhagen.
- **19**: Hiring committee, editor-in-chief, Universitetsavisen (University of Copenhagen independent newspaper).
- **19,20**: Hiring committee, journalists, Universitetsavisen (University of Copenhagen independent newspaper).
- **19**: Advisory hiring committee, dean, Faculty of Science, University of Copenhagen.

Various appointments and duties:

- **98–22**: Danish corps of external examiners.
- **06–07**: Chairman, "Den gode underviser" [Committee for furthering of teaching and teachers], The Faculty of Science, University of Copenhagen.
- **09**: International expert, The Danish Evaluation Institute
"Mathematics A and B at upper-secondary level (STX and HTX) in an international perspective"
- **11–12,19–22**: Member of the board of the University of Copenhagen newspaper Universitetsavisen. Chairman from 2019.
- **13–16,19–22**: Academic council, University of Copenhagen, member
- **17**: External expert, evaluation of Aarhus University mathematics programs.

Honors:

- Faculty of Science, University of Copenhagen: Teaching prize **98 & 00**
- Faculty of Science, University of Copenhagen: Educator of the year **12**.
- Faculty of Science, University of Copenhagen: Communication prize **13**.
- University of Copenhagen: Nominated for Harald Bohr price (university-wide educator of the year) **16**.