

Jorgensen research areas 2024.

Areas with sample papers, recent papers:

Stochastic analysis.

[Jorgensen, Palle](#); [Tian, James](#) Infinite-dimensional analysis—operators in Hilbert space; stochastic calculus via representations, and duality theory. *World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ*, [2021], ©2021. xvii+234 pp. ISBN: [9789811225772].

Probability/statistics.

[Jorgensen, Palle E. T.](#); [Tian, James](#) Hilbert space valued Gaussian processes, their kernels, factorizations, and covariance structure. *Adv. Oper. Theory* 9 (2024), no. 4, Paper No. 77, 17 pp.

[Alpay, Daniel](#); [Jorgensen, Palle](#) μ -Brownian motion, dualities, diffusions, transforms, and reproducing kernel Hilbert spaces. *J. Theoret. Probab.* 35 (2022), no. 4, 2757–2783.

Math physics.

[Alpay, Daniel](#); [Jorgensen, Palle](#) Reflection positivity via Krein space analysis. *Adv. in Appl. Math.* 141 (2022), Paper No. 102411, 45 pp.

[Jørgensen, Palle E. T.](#) Trotter's limit formula for the Schrödinger equation with singular potential. *J. Math. Phys.* 58 (2017), no. 12, 122101, 13 pp.

[Jorgensen, Palle](#); [Pedersen, Steen](#); [Tian, Feng](#) Translation representations and scattering by two intervals. *J. Math. Phys.* 53 (2012), no. 5, 053505, 49 pp.

Quantum information.

[Bratteli, O.](#); [Jorgensen, P. E. T.](#); [Kishimoto, A.](#); [Werner, R. F.](#) Pure states on O_d . *J. Operator Theory* 43 (2000), no. 1, 97–143.

[Jorgensen, P. E. T.](#); [Schmitt, L. M.](#); [Werner, R. F.](#) Positive representations of general commutation relations allowing Wick ordering. *J. Funct. Anal.* 134 (1995), no. 1, 33–99.

[Jorgensen, P. E. T.](#); [Werner, R. F.](#) Coherent states of the q -canonical commutation relations. *Comm. Math. Phys.* 164 (1994), no. 3, 455–471.

Operator algebras.

[Cho, Ilwoo](#); [Jorgensen, Palle E. T.](#) Multi variable semicircular processes from $*$ -homomorphisms and operators. *New directions in function theory: from complex to hypercomplex to non-commutative*, 199–242, *Oper. Theory Adv. Appl.*, 286, *Linear Oper. Linear Syst.*, Birkhäuser/Springer, Cham, [2021], ©2021.

[Jorgensen, Palle E. T.](#) Intertwining operators, derivations of the CAR-algebra, and representations of $U(p,q)$. *Current topics in operator algebras (Nara, 1990)*, 381–394, *World Sci. Publ.*, River Edge, NJ, 1991.

[Jorgensen, Palle E. T.](#) Representations of symplectic vector spaces obtained as unitary dilations. *Selfadjoint and nonselfadjoint operator algebras and operator theory (Fort Worth, TX, 1990)*, 41–60, [Contemp. Math.](#), **120**, Amer. Math. Soc., Providence, RI, 1991.

Operator theory.

[Jorgensen, Palle E. T.](#); [Pearse, Erin P. J.](#) Symmetric pairs and self-adjoint extensions of operators, with applications to energy networks. [Complex Anal. Oper. Theory](#) **10** (2016), no. 7, 1535–1550.

[Alpay, Daniel](#); [Jorgensen, Palle E. T.](#); [Kimsey, David P.](#) Moment problems in an infinite number of variables. [Infin. Dimens. Anal. Quantum Probab. Relat. Top.](#) **18** (2015), no. 4, 1550024, 14 pp.

[Jorgensen, Palle](#); [Pedersen, Steen](#); [Tian, Feng](#) Restrictions and extensions of semibounded operators. [Complex Anal. Oper. Theory](#) **8** (2014), no. 3, 591–663.

Harmonic analysis.

[Herr, John E.](#); [Jorgensen, Palle E. T.](#); [Weber, Eric S.](#) Harmonic analysis of fractal measures: basis and frame algorithms for fractal L_2 -spaces, and boundary representations as closed subspaces of the Hardy space. *Analysis, probability and mathematical physics on fractals*, 163–221, [Fractals Dyn. Math. Sci. Arts Theory Appl.](#), **5**, World Sci. Publ., Hackensack, NJ, [2020].

[Jorgensen, Palle E. T.](#) Harmonic analysis. Smooth and non-smooth. Published for the Conference Board of the Mathematical Sciences. [CBMS Regional Conference Series in Mathematics](#), **128**. American Mathematical Society, Providence, RI, 2018. xi+266 pp.

[Jorgensen, Palle E. T.](#); [Pedersen, Steen](#) Dense analytic subspaces in fractal L_2 -spaces. [J. Anal. Math.](#) **75** (1998), 185–228.

Groups.

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) Unitary groups and spectral sets. [J. Funct. Anal.](#) **268** (2015), no. 8, 2102–2141.

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) A duality approach to representations of Baumslag-Solitar groups. *Group representations, ergodic theory, and mathematical physics: a tribute to George W. Mackey*, 99–127, [Contemp. Math.](#), **449**, Amer. Math. Soc., Providence, RI, 2008.

[Bratteli, Ola](#); [Jorgensen, Palle E. T.](#); [Kim, Ki Hang](#); [Roush, Fred](#) Computation of isomorphism invariants for stationary dimension groups. [Ergodic Theory Dynam. Systems](#) **22** (2002), no. 1, 99–127.

Wavelets.

[Jorgensen, Palle](#) Hermite-wavelet transforms of multivariate functions on $[0,1]^d$. [Acta Appl. Math.](#) **170** (2020), 773–788.

[Alpay, Daniel](#); [Jorgensen, Palle](#); [Lewkowicz, Izchak](#) Parametrizations of all wavelet filters: input-output and state-space. *Sampl. Theory Signal Image Process.* 12 (2013), no. 2-3, 159–188.

[Albeverio, S.](#); [Jorgensen, P. E. T.](#); [Paolucci, A. M.](#) On fractional Brownian motion and wavelets. *Complex Anal. Oper. Theory* 6 (2012), no. 1, 33–63.

[Jorgensen, Palle E. T.](#) Analysis and probability: wavelets, signals, fractals. *Graduate Texts in Mathematics*, 234. Springer, New York, 2006. xlviii+276 pp. ISBN: 978-0-387-29519-0.

Signal/image processing.

[Alpay, Daniel](#); [Jorgensen, Palle](#); [Lewkowicz, Izchak](#) Representation theory and multilevel filters. *J. Appl. Math. Comput.* 69 (2023), no. 2, 1599–1657.

[Jorgensen, Palle E. T.](#); [Song, Myung-Sin](#) Scaling, wavelets, image compression, and encoding. *Analysis for science, engineering and beyond*, 215–252, *Springer Proc. Math.*, 6, Springer, Heidelberg, 2012.

Dynamical systems.

[Bezuglyi, Sergey](#); [Jorgensen, Palle E. T.](#) IFS measures on generalized Bratteli diagrams. *Recent developments in fractal geometry and dynamical systems*, 123–145, *Contemp. Math.*, 797, AMS 2024.

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) Hilbert spaces of martingales supporting certain substitution-dynamical systems. *Conform. Geom. Dyn.* 9 (2005), 24–45.

Fractals.

[Khalili Golmankhaneh, Alireza](#); [Jørgensen, Palle E. T.](#); [Schlichtinger, Agnieszka Matylda](#) Einstein field equations extended to fractal manifolds: a fractal perspective. *J. Geom. Phys.* 196 (2024), Paper No. 105081, 14 pp.

[Jorgensen, Palle E. T.](#); [Tian, James](#) Stochastics and dynamics of fractals. *Recent developments in operator theory, mathematical physics and complex analysis*, 171–216, *Oper. Theory Adv. Appl.*, 290, Birkhäuser/Springer, Cham, [2023]

[Jorgensen, Palle E. T.](#); [Kornelson, Keri A.](#); [Shuman, Karen L.](#) Additive spectra of the 14 Cantor measure. *Operator methods in wavelets, tilings, and frames*, 121–128, *Contemp. Math.*, 626, Amer. Math. Soc., Providence, RI, 2014.

[Jorgensen, Palle E. T.](#); [Kornelson, Keri A.](#); [Shuman, Karen L.](#) An operator-fractal. *Numer. Funct. Anal. Optim.* 33 (2012), no. 7-9, 1070–1094.

Machine learning.

[Jorgensen, Palle E. T.](#); [Song, Myung-Sin](#); [Tian, James](#) Conditional mean embedding and optimal feature selection via positive definite kernels. *Opuscula Math.* 44 (2024), no. 1, 79–103.

[Jorgensen, Palle](#); [Stewart, David E.](#) Approximation properties of ridge functions and extreme learning machines. *SIAM J. Math. Data Sci.* 3 (2021), no. 3, 815–832.

Analysis on graphs.

[Bezuglyi, Sergey](#); [Jorgensen, Palle E. T.](#) New Hilbert space tools for analysis of graph Laplacians and Markov processes. *Complex Anal. Oper. Theory* 17 (2023), no. 7, Paper No. 111, 86 pp.

[Jorgensen, Palle](#); [Tian, James](#) Harmonic analysis of network systems via kernels and their boundary realizations. *Discrete Contin. Dyn. Syst. Ser. S* 16 (2023), no. 2, 277–308.

Representation theory.

[Farsi, Carla](#); [Gillaspy, Elizabeth](#); [Jorgensen, Palle](#); [Kang, Sooran](#); [Packer, Judith](#) Monic representations of finite higher-rank graphs. *Ergodic Theory Dynam. Systems* 40 (2020), no. 5, 1238–1267.

[Jorgensen, Palle](#); [Tian, Feng](#) Induced representations arising from a character with finite orbit in a semidirect product. *New York J. Math.* 21 (2015), 783–800.

[Jorgensen, Palle E. T.](#); [Ólafsson, Gestur](#) Unitary representations and Osterwalder-Schrader duality. *The mathematical legacy of Harish-Chandra (Baltimore, MD, 1998)*, 333–401, *Proc. Sympos. Pure Math.*, 68, Amer. Math. Soc., Providence, RI, 2000.

[Jorgensen, Palle E. T.](#); [Ólafsson, Gestur](#) Unitary representations of Lie groups with reflection symmetry. *J. Funct. Anal.* 158 (1998), no. 1, 26–88.

[Jorgensen, Palle E. T.](#) Quantization and deformation of Lie algebras. *Lie algebras, cohomology, and new applications to quantum mechanics (Springfield, MO, 1992)*, 141–149, *Contemp. Math.*, 160, Amer. Math. Soc., Providence, RI, 1994.

Spectral theory.

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) Spectral duality for unbounded operators. *J. Operator Theory* 65 (2011), no. 2, 325–353.

Geometry.

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) On the universal tiling conjecture in dimension one. *J. Fourier Anal. Appl.* 19 (2013), no. 3, 467–477.

Complex analysis.

[Alpay, Daniel](#); [Jorgensen, Palle](#); [Seager, Ron](#); [Volok, Dan](#) On discrete analytic functions: products, rational functions and reproducing kernels. *J. Appl. Math. Comput.* 41 (2013), no. 1-2, 393–426.

Potential theory.

Book 2024. **Brownian Motion and Potential Theory, Modern and Classical**

<https://doi.org/10.1142/13872> | November 2024. Pages: 260, [Palle Jorgensen](#) ; [Murali Rao](#) and , [James Tian](#).

[Dutkay, Dorin Ervin](#); [Jorgensen, Palle E. T.](#) Affine fractals as boundaries and their harmonic analysis. *Proc. Amer. Math. Soc.* 139 (2011), no. 9, 3291–3305.

PDE.

[Bratteli, Ola](#); [Jørgensen, Palle E. T.](#); [Robinson, Derek W.](#) Spectral asymptotics of periodic elliptic operators. *Math. Z.* 232 (1999), no. 4, 621–650.

[Batty, Charles J. K.](#); [Bratteli, Ola](#); [Jørgensen, Palle E. T.](#); [Robinson, Derek W.](#) Asymptotics of periodic subelliptic operators. *J. Geom. Anal.* 5 (1995), no. 4, 427–443.