Curriculum Vitae

Professor, Dr.Techn., Ole Sigmund, January 31, 2025

Work address

Department of Civil and Mechanical Engineering
Solid Mechanics
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DK-2800 Lyngby, Denmark
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DK-2800 Lyngby, Denmark
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Personal Details

Date of birth: May 28th, 1966
Citizenship: Danish
Civil status: married, 2 children

Degrees

5/2001	Dr.Techn., Technical University of Denmark
1/1995	Ph.D., Technical University of Denmark
9/1991	M.Sc., Technical University of Denmark

Positions

2025–	Elected member of the Executive Board of the Technical University of Denmark (DTU).
2023–	Villum Investigator, Villum Foundation.
2022–	Elected member of the EUROMECH Council.
2021–2024	Elected member of the Executive Board of the Technical University of Denmark (DTU).
2019–2023	Elected member, ISSMO Executive Committee.
2018–2021	Technical advisor and optionholder in Oqton (acquired by 3D Systems for 140M$US Fall 2021).
2017–2023	Villum Investigator, Villum Foundation.
2015–2019	Past President, ISSMO Executive Committee.
2011–2015	Elected President of ISSMO (Int. Soc. for Structural and Multidisciplinary Optimization)
2011–2014	Head of Section, Solid Mechanics, Dept. Mech. Eng., Technical University of Denmark
2010–	Professor, Dept. Mech. Eng., Technical University of Denmark
2004–2010	Chairman for the Danish Center for Applied Mathematics and Mechanics (www.dcamm.dk)
2001–2010	Professor with special assignments, Dept. Mech. Eng., Technical University of Denmark
1997–2001	Associate Research Professor, Dept. Solid Mechanics, Technical University of Denmark
1995–1996	Postdoc, Princeton Materials Institute, Princeton University
1995–1997	Assistant Research Professor, Dept. Solid Mechanics, Technical University of Denmark
1993–1994	Ph.D.-student, Technical University of Denmark
1991–1992	Research Assistant, University of Essen, Germany

Honours and awards

2023	ICBS, Frontiers of Science Award, Beijing, China.
2022	Highly Cited Researcher, Web of Science, 2022
2020	Knight of the Order of the Dannebrog (Ridder af Dannebrog)
2017	Hyperion Innovation Excellence Award, Super Computing 17, Denver CO, USA, November.
2015	AMS (Acta Mechanica Sinica) 30^{th} Anniversary Special Award
2014	Newmark Distinguished Lecture, U. of Illinois, October
2014	Danish Council for Independent Research, Sapere Aude (Top-forsker): DFF-Advanced Grant
2014	Honorary Visiting Professor, North Western Polytechnical University (NPU), Xi'an, China
2010	Villum Kann Rasmussen Prize (2.5MDkr)
2008	Elite Research Prize of The Danish Ministry of Science 2007 (1 MDKr), Denmark
2005	Annual party speaker at DTU
2004	European Young Investigator Award (EURYI), European Science Foundation
2002	Grundfos-Prize (1 MDkr), Bjerringbro, Denmark
2000	Invited Sectional Lecturer at the 20th International Congress of Theoretical and Applied Mechanics (ICTAM 2000), August, Chicago
2000	STATOIL-prize, Copenhagen
1999	ISSMO/Springer Prize 1999 for Young Scientists
1996	Gorm Pedersens Memorial Prize, Technical University
1995	1st prize in poster competition, Fall Materials Fair, Princeton Materials Inst.

Memberships / Boards

2022–	Associate Editor of Programmable Materials
2021–	Member of the prize committee for the Grundfos Prize
2020–	Advisory board of Forces in Mechanics
2018–	Senior Advisor Journal of Structural and Multidisciplinary Optimization
2016–	Editorial board of Journal of Optimization Theory and Applications
2016-2019	The ESF College of Expert Reviewers
2015–	Advisory Committee of the State Key Lab, Dalian Univ. of Tech., China
2013-2019	DeIC eScience Committee, Danish Research Ministry
2011-2014	Member of the Villum Foundation Young Investigator Grant committee
2011-2013	Editorial board of Computer Methods in Applied Mechanics
2010-2015	Reviewer panel for Danish National Advanced Technology Foundation
2010–2019	Member of the Statoil Prize award committee
2010–	Advisory Board of Computational Mechanics
2008–2010	Research Board, Dept. Mech. Eng., DTU
2008–	Editorial Board of Acta Mechanica Sinica
2008-2016	Editorial Board of Archive of Applied Mechanics
2008–	Royal Danish Academy of Sciences and Letters
2006-2009	ESF Pool of Referees
2003–	Editorial Board of Latin American Journal of Solid and Structures
2003–	Danish Academy of Technical Sciences (ATV)
2003–2005	"Fagligt Forum", Danish Technical Research Council
2002–2005	Member of board, Department of Mechanical Engineering,
2000–2018	Editorial Board of Structural and Multidisciplinary Optimization
2000–	Advisory board of Int. J. for Num. Methods in Engineering DTU

Further Courses/Education

2021	Followed "The Board of Directors' Training Programme at Niels Brock
2014	The DTU Leadership Programme
2001	Advanced course in education methods (Kursus i Didaktik og Undervisningspædagogik for Undervisere på DTU), DTU
2000	Basic course in education (Grundkursus i Pædagogik), DTU.

Research interests

Principal research interests are theoretical extensions and applications of topology optimization methods to the design of extremal materials, smart materials, compliant mechanisms, MicroElectroMechanical Systems, crashworthiness, fluid systems and wave-propagation problems in acoustics, elasticity, optics, antennas and meta-materials as well as in sustainable energy applications.

Grants (Personal[/total])

2023-2028	PI, Villum Investigator Project: " Architected Materials and Structures with Randomness And Defects (AMSTRAD)", Villum Foundation (30MDKK).
2022-2025	CI, Towards extreme heat transfer − combining multiphysics-multi scale modelling, topology optimization as well as superconductive materials, Danish Council for Independent Research, DFF-2 Grant (2/6 MDKK).
2021-2025	PI, Topology Optimization for contact problems (TopCon), Danish Council for Independent Research, DFF-2 Grant (6 MDKK).
2020-2025	CI, WP-Leader, NanoPhoton, DNRF, Danish National Research Foundation (6/62 MDKK).
2018-2019	Principal Investigator, PRACE (Partnership for Advanced Computing in Europe) 17th call for access to super-computing resources. Project: TopBridge 15M CPUh on Joliot-Curie SKL supercomputer.
2017-2023	PI, Villum Investigator Project: "Interactive, non-linear,high-resolution Topology Optimization (InnoTop)", Villum Foundation (28/31MDKK).
2016-2017	Affiliated Investigator, Innobooster Project: "Improved implants for mastectomy", Innovation Fund Denmark, 3D-Print-Huset, Copenhagen (0.45MDKK).
2015-2018	Affiliated Investigator, Research Project Suntune, Innovation Fund Denmark, Aarhus University + companies (0.4MDKK).
2015-2020	Co-Investigator in a Villum Kann Rasmussen Centre of Excellence: "NAnophotonics for TErabit Communications – 2" (NATEC-2) (2.5/25 MDKK)

2015-2016 Principal Investigator, PRACE (Partnership for Advanced Computing in Europe) 10th call for access to super-computing resources. Project: "TopWing – Topology optimization of aircraft wing", 11M CPUh on CURIE supercomputer.

2014-2018 Principal Investigator, Research Project TopTEN, Danish Council for Independent Research, Sapere Aude: DFF-Advanced Grant 2014 (11.6 MDKK).

2014-2017 Co-Investigator, HTF, Danish National Advanced Technology Foundation: "HYPERCOOL - Passive cooling for LED lamps" (1.4/4.6 MDKK)

2011-2015 Co-Investigator, HTF, Danish National Advanced Technology Foundation: "ODASS - Optically designed anodized aluminium surfaces." (1.5/27 MDKK).

2011-2013 Co-Investigator, Innovation Consortium F•Mat (3/17.1 MDKK).

2011-2015 Principal Investigator, Research Project NextTop, Villum Foundation (14 MDKK).

2010-2012 Principal Investigator, Supercomputing facilities at Danish Center for Scientific Computing (0.75 MDKK).

2010-2013 Co-Investigator, HTF, Danish National Advanced Technology Foundation: "Nanoplast – Functional nanostructures on injection molded plastic" (1/120 MDKK).

2009-2012 Participant in CASE (Catalysis for Sustainable Energy) Center sponsored by the Danish Minister of Science.

2008-2015 Co-Investigator in a Villum Kann Rasmussen Centre of Excellence: "NAnophotonics for TErabit Communications" (NATEC) (2.5/25 MDKK)

2008-2010 Principal Investigator, Supercomputing facilities at Danish Center for Scientific Computing (1.5 MDKK).

2005-2007 Principal Investigator, Supercomputing facilities at Danish Center for Scientific Computing.

2005-2007 Participant in NEDO research project (New Energy and Industrial Technology Research Organization, Japan) in collaboration with Tsukuba and Ghent Universities (0.3 MDKK).

2005-2010 Principal Investigator, EURYI project, European Science Foundation: "Synthesis and topology optimization of optomechanical systems" (1.16 MEuro)

2005 Rectors Strategic funding, DTU (0.5 MDKK).

2003-2005 Principal Investigator, STVF project, Danish Technical Research Council: "Designing bandgap materials and structures with optimized dynamic properties" (2.9 MDKK)

2003-2004 Principal Investigator, Toubro Foundation: "Development of 3D interactive topology optimization program" (25 kDKK)

2001-2002 Participant STVF, research project, "Phononic band gaps: analysis and optimization of wavepropagation in periodic materials" (0.66 MDKK)

1997-2003 Participant Research Project: Danish Center for Integrated Design (CID), Danish Research Agency

1997-2002 Principal Investigator, STVF Talent/THOR-programme (Technology for Highly Oriented Research), Danish Technical Research Council: "Design of MicroElectroMechanical Systems (MEMS)" (7.22 MDKK)

Extended visits

with Prof. Kurt Maute, University of Colorado, Boulder, January-July, 2012.
with Prof. Alejandro R. Diaz, Michigan State University, MI, USA, April-May, 1994.
with Profs. John E. Taylor and Noboru Kikuchi, University of Michigan, May-June, 1994.

Present and former industry collaborations

10i10, Denmark
Comsol, Sweden
DICON A/S, Lystrup, Denmark
FE-Design, 3ds, Germany. Now Simulia/Dassault.
IONAS A/S, Optics company, Birkerød, Denmark
KOHERAS A/S, Optics company, Birkerød, Denmark
MAN B&W Diesel, Copenhagen, Denmark
NIL Technology, Lyngby, Denmark
nTopology, Ney York, USA.
NOVO A/S, Hillerød, Denmark
Oqton Denmark A/S, Lyngby, Denmark
TOYOTA R&D, Japan
Widex, Denmark
3D-Printhuset

Conference organizations

2023	Organizer of IUTAM Symposium "Ultralarge-scale Topology Optimization", Royal Society of Sceince and Letters, Copenhagen.
2015	Overseeing and co-organization of WCSMO-11 in Sydney, Australia, as President of ISSMO.
2013	Overseeing and co-organization of WCSMO-10 in Orlando, Florida, as President of ISSMO.
2009	Organizer of DCAMM's 12. Internal Symposium, Ringsted, Denmark, March (106 participants).
2007	Organizer of DCAMM's 11. Internal Symposium, Silkeborg, Denmark, March (81 participants).
2005	Organizer of DCAMM's 10. Internal Symposium, Skælskør, Denmark, March (90 participants).
2005	Co-organizer of IUTAM Symposium on Topological Design Optimization of Structures, Machines and Materials - Status and Perspective, Copenhagen.

Papers and citations

Total of 299 accepted papers in international journals, 1 monograph (co-authored with M. P. Bendsøe, 1 edited book, 3 patent applications (one granted), 80+ proceedings papers and 3 book chapters.

Number of citations in ISI Science Citation Index is 36,400 (plus 4500 to the monograph and 300 to the ph.d.-thesis). Hirsch h-index is 85 (including monograph and thesis). 10 of the papers are on the ISI Highly cited paper list, c.f. refs. [136, 139, 152, 158, 168, 172, 186, 222, 232, 250] below. Highly Cited Researcher, Web of Science, 2022.

Number of citations in Google Scholar is 71,800 and h-index is 105.

Books

[2] M. P. Bendsøe, N. Olhoff, and O. Sigmund, eds. *Topological design optimization of structures, machines and materials : Status and perspectives*. Solid Mechanics and its Applications. IUTAM Symposium on Topological Design Optimization of Structures, Machines and Materials. Dordrecht/Berlin: Kluwer/Springer, 2006, p. 608.

[1] M. P. Bendsøe and O. Sigmund. *Topology Optimization - Theory, Methods and Applications*. Springer, 2003.

Theses

[3] O. Sigmund. *Topology Optimization Methods with Applications in Mechanism, MEMS and Material Design*. Thesis for the Danish Dr.Techn. Degree. Technical University of Denmark, 2001.

[2] O. Sigmund. "Design of material structures using topology optimization". The Danish Center for Applied Mathematics and Mechanics, DCAMM Special Report No. S69. PhD thesis. Department of Solid Mechanics, Technical University of Denmark, DK-2800 Lyngby, Dec. 1994.

[1] O. Sigmund. "Dynamically reconfigurable adaptive truss manipulator". MA thesis. Department of Solid Mechanics, Technical University of Denmark, 1991.

Papers in International Journals

[303] A. Dalklint, R.E. Christiansen, and O. Sigmund. "On performance bounds for topology optimization". In: *Submitted* (2024). eprint: `arXiv:2410.20375`.

[302] G. Isiklar, R.E. Christiansen, and O. Sigmund. "Topology Optimization of Thermal Initial Value Problems Exploiting Efficient Harmonic Analysis". In: *Submitted* (2024).

[301] Z. Zhao, R.D. Kundu, O. Sigmund, and X.S. Zhang. "Extreme nonlinearity by layered materials through inverse design". In: *Submitted* (2024).

[300] B.M.A Jokish, R.E. Christiansen, and O. Sigmund. "Engineering optical forces through Maxwell stress tensor inverse design". In: *Journal of the Optixcal Society of America B (JOSA B)* (2025). eprint: `arXiv:2410.20009`.

[299] C.F. Christensen, J. Engqvist, F. Wang, O. Sigmund, and M. Wallin. "Extremal Structures with Embedded Pre-Failure Indicators". In: *Proceedings of the National Academy of Sciences (PNAS)* 122.5 (2025), e2412285122.

[298] V. Cool, O. Sigmund, and N. Aage. "Metamaterial design with vibroacoustic bandgaps through topology optimization". In: *Computer Methods in Applked Mechanics and Engineering* 436 (2025), p. 117744.

[297] A. Dalklint, J. Alexandersen, A.H. Frederiksen, K. Poulios, and O. Sigmund. "Topology optimization of contact-aided thermo-mechanical regulators". In: *International Journal for Numerical Methods in Engineering* 126.2 (2025), e7661. arXiv: `2406.00865`.

[296] A.H. Frederiksen, A. Dalklint, O. Sigmund, and K. Poulios. "Improved Third Medium Formulation for 3D TopologyOptimization with Contact". In: *Computer Methods in Applied Mechanics and Engineering* 436 (2025), p. 117595.

[295] V. Cool, O. Sigmund, N. Aage, F. Naets, and E. Deckers. "Vibroacoustic topology optimization for sound transmission minimization through sandwich structures". In: *Journal of Sound and Vibration* 568 (2024), p. 117959.
[294] A.H. Frederiksen, O. Rokos, K. Poulios, O. Sigmund, and M.G.D. Geers. "Adding friction to Third Medium Contact: A crystal plasticity inspired approach". In: *Computer Methods in Applied Mechanics and Engineering* 432 (2024), p. 117412.
[293] AH Frederiksen, O Sigmund, and K Poulios. "Topology Optimization of self-contacting structures". In: *Computational Mechanics* 73 (2024), pp. 967–981. eprint: `arXiv:2305.06750`.
[292] L. Herrmann, O-Sigmund, V.M. Li, C. Vogl, and S. Kollmannsberger. "On Neural Networks for Generating Better Local Optima in Topology Optimization". In: *Structural and Multidisciplinary Optimization* 67.11 (2024), p. 192. eprint: `arXiv:2407.17957`.
[291] A. Homayouni-Amlashi, O. Sigmund, T. Schlinquer, M. Rakotondrabe, and A. Mohand-Ousaid. "Matlab codes for 3D topology optimization of multi-material piezoelectric actuators and energy harvesters". In: *Structural and Multidisciplinary Optimization* 67.9 (2024), p. 165.
[290] P.D.L. Jensen, T.F. Olsen, J.A. Bærentzen, N. Aage, and O. Sigmund. "Efficient Inverse-designed Structural Infill for Complex Engineering Structures". In: *Thin-Walled Structures* 195 (2024), p. 111427. eprint: `arXiv:2307.09518`.
[289] B.M.A Jokish, R.E. Christiansen, and O. Sigmund. "Topology Optimization framework for designing efficient Thermo-Optical Phase Shifters". In: *Journal of the Optical Society of America,: B* 41.2 (2023), A18–A31.
[288] B. Martinez de Aguirre Jokisch, B. Gøtzsche, P. Kristensen, M. Wubs, O. Sigmund, and R.E. Christiansen. "Omnidirectional Gradient Force Optical Trapping in Dielectric Nanocavities by Inverse Design". In: *ACS Photonics* 11.12 (2024), pp. 5118–5127.
[287] W. Li, O. Sigmund, and X.S. Zhang. "Analytical realization of complex thermal meta-devices". In: *Nature Communications* 15 (2024), p. 5527.
[286] C. Mommeyer, G. Lombaert, M. Schevenels, and O. Sigmund. "Taylor Series Approximations for Faster Robust Topology Optimization". In: *Structural and Multidisciplinary Optimization* 67 (2024), p. 181.
[285] Y. Wang and O. Sigmund. "Topology optimization of multi-material active structures to reduce energy consumption and carbon footprint". In: *Structural and Multidisciplinary Optimization* 67.1 (2024), p. 5.
[284] R.V. Woldseth, J.A. Bærentzen, and O. Sigmund. "Phasor noise for dehomogenisation in 2D multiscale topology optimisation". In: *Computer Methods in Applied Mechanics and Engineering* 418 (2024), p. 116551. eprint: `arxiv.org/abs/2310.04881`.
[283] R.V. Woldseth, O. Sigmund, and P.D.L Jensen. "An 808 Line Phasor-Based Dehomogenisation Matlab Code For Multi-Scale Topology Optimisation". In: *Structural and Multidisciplinary Optimization* 67 (2024), p. 205. arXiv: `arXiv:2405.14321`.
[282] M. Xiong, R.E. Christiansen, F. Schröder, Y. Yu, L.N. Casses, E. Semenova, K. Yvind, N. Stenger, O. Sigmund, and J. Mørk. "Experimental realization of deep sub-wavelength confinement of light in a topology-optimized InP nanocavity". In: *Optics Express* 14.2 (2024), pp. 397–406.
[281] M. Bayat et al. "Holistic computational design within additive manufacturing through topology optimization combined with multiphysics multi-scale materials and process modelling". In: *Progress in Materials Science* (2023), p. 101129.
[280] LG Bluhm, O Sigmund, and K Poulios. "Inverse design of mechanical springs with tailored nonlinear elastic response utilizing internal contact". In: *International Journal of Non-Linear Mechanics* 157 (2023), p. 104552.
[279] R.E. Christiansen, P.T. Kristensen, J. Mørk, and O. Sigmund. "Impact of the Figure of Merit for Optimizing Light-Matter Interaction in Photonic Inverse Design". In: *Optics Express* 31.5 (2023), p. 8363.
[278] C.F. Christensen, F. Wang, and O. Sigmund. "Topology Optimization of Multiscale Structures Considering Local and Global Buckling Response". In: *Computer Methods in Applied Mechanics and Engineering* 408 (2023), p. 115969. eprint: `arXiv:2210.11477`.
[277] F. Ferrari and O. Sigmund. "A strategy for avoiding spurious localized buckling modes in topology optimization". In: *International Journal for Numerical Methods in Engineering* 124.18 (2023), pp. 4118–4140.
[276] A.C. Hayes, E.A. Träff, C.V. Sørensen, S.V. Willems, N. Aage, O. Sigmund, and G.L. Whiting. "Topology Optimization For Structural Mass Reduction of Direct Drive Electric Machines". In: *Sustainable Energy Technologies and Assessments* 57 (2023), p. 103254.
[275] L.C. Høghøj, C. Conlan-Smith, O-Sigmund, and CS Andreasen. "Coupled aeroelastic shape and topology optimization of wings". In: *Structural and Multidisciplinary Optimization* 66 (2023), p. 116. eprint: `arXiv:2209.09330`.
[274] W. Li, Y. Jia, F. Wang, O. Sigmund, and X.S. Zhang. "Programming and physical realization of extreme three-dimensional responses of metastructures under large deformations". In: *International Journal of Engineering Science* 191 (2023), p. 103881.
[273] E.A. Träff, A. Rydahl, S. Karlsson, O. Sigmund, and N. Aage. "Simple and Efficient GPU accelerated Topology Optimisation: codes and applications". In: *Computer Methods in Applied Mechanics and Engineering* 410 (2023), p. 116043.

[272] J. Tucek, M. Capek, L. Jelinek, and O. Sigmund. "Density-Based Topology Optimization in Method of Moments: Q-factor Minimization". In: *IEEE Transactions on Antenna and Propagation* 71.12 (2023). online, pp. 9738–9751. eprint: arXiv:2303.15290.

[271] F. Wang, M. Brøns, and O. Sigmund. "Non-hierarchical architected materials with extreme stiffness and strength". In: *Advanced Functional Materials* (2023), p. 2211561.

[270] F. Wang and O. Sigmund. "Architecting materials for extremal stiffness, yield and buckling strength". In: *Programmable Materials* 1 (2023), e6. eprint: arXiv:2210.00003.

[269] Y. Wang and O. Sigmund. "Multi-material Topology Optimization for Maximizing Structural Stability under Thermo-Mechanical Loading". In: *Computer Methods in Applied Mechanics and Engineering* 407 (2023), p. 115938.

[268] M. Albrechtsen et al. "Nanometer-scale photon confinement inside dielectrics". In: *Nature Communications* 13 (2022), p. 6281. eprint: arXiv:2108.01681.

[267] M.N. Andersen, Y. Wang, F. Wang, and O. Sigmund. "Buckling and yield strength estimation of architected materials under arbitrary loads". In: *International Journal of Solids and Structures* 254-255 (2022), p. 111842.

[266] T. Barbier, E. Shakour, O. Sigmund, G. Lombaert, and M. Scheveels. "Topology optimization of damage-resistant structures with a predefined load-bearing capacity". In: *International Journal for Numerical Methods in Engineering* 123.4 (2022), pp. 1114–1145.

[265] G.L. Bluhm, K. Christensen, K. Poulios, O. Sigmund, and F. Wang. "Experimental verification of a novel hierarchical lattice material with superior buckling strength". In: *APL Materials* 10.9 (2022), p. 090701.

[264] M.O. Elingaard, N. Aage, J.A. Bærentzen, and O. Sigmund. "De-homogenization using Convolutional Neural Networks". In: *Computer Methods in Applied Mechanics and Engineering* 388 (2022), p. 114197. eprint: arxiv.org/abs/2105.04232.

[263] Göktuğ Işiklar, Philip Trøst Kristensen, Jesper Mørk, Ole Sigmund, and Rasmus Ellebæk Christiansen. "On the trade-off between mode volume and quality factor in dielectric nanocavities optimized for Purcell enhancement". In: *Optics Express* 30.26 (2022), pp. 47304–47314.

[262] P.D.L. Jensen, O. Sigmund, and J.P. Groen. "De-homogenization of Optimal 2D Topologies for Multiple Loading Cases". In: *Computer Methods in Applied Mechanics and Engineering* 399 (2022), p. 115426.

[261] W. Li, F. Wang, O. Sigmund, and X.S. Zhang. "Digital synthesis of free-form multimaterial structures for realization of arbitrary programmed mechanical responses". In: *Proceedings of the National Academy of Sciences* 119.10 (2022), e2120563119.

[260] Y. Luo, O. Sigmund, Q. Li, and S. Liu. "Topology optimization of structures with infill-supported enclosed voids for additive manufacturing". In: *Additive Manufacturing* 55 (2022), p. 102795.

[259] T. Navez, M.-P. Schmidt, O. Sigmund, and C.B.W. Pedersen. "Topology optimization guided by a geometrical pattern library". In: *Structural and Multidisciplinary Optimization* 65.4 (2022), p. 108.

[258] O. Sigmund. "On benchmarking and good scientific practise in topology optimization". In: *Structural and Multidisciplinary Optimization* 65 (2022), p. 315.

[257] G.A. da Silva, A.T. Bech, and O. Sigmund. "Structural topology optimization with predetermined breaking points". In: *Computer Methods in Applied Mechanics and Engineering* 400 (2022), p. 115610.

[256] F.C. Stutz, T.F. Olsen, J.P. Groen, N. Aage, O. Sigmund, J. Solomon, and J.A. Bærentzen. "Synthesis of Frame Field-Aligned Multi-Laminar Structures". In: *ACM Transactions on Graphics* 41.5 (2022).

[255] B. Telgen, O. Sigmund, and D. Kochmann. "Topology optimization of graded truss lattices based on on-the-fly homogenization". In: *Journal of Applied Mechanics* 89.6 (Apr. 2022), p. 061006.

[254] R.V. Woldseth, N. Aage, J.A. Bærentzen, and O. Sigmund. "On the use of artificial neural networks in topology optimisation". In: *Structural and Multidisciplinary Optimization* 65 (2022), p. 294. eprint: arxiv.org/abs/2208.02563.

[253] J. Zhang, F. Wang, O. Sigmund, L. Gao, and R.E. Christiansen. "Ultra-broadband edge-state pair for zigzag-interfaced valley Hall insulators". In: *Science China Physics, Mechanics & Astronomy* 65.5 (2022), p. 257011.

[252] M.N. Andersen, F. Wang, and O. Sigmund. "On the competition for ultimately stiff and strong architected materials". In: *Materials & Design* 198 (2021), p. 109356.

[251] G.L. Bluhm, O. Sigmund, and K. Poulios. "Internal contact modeling for finite strain topology optimization". In: *Computational Mechanics* 67 (2021), pp. 1099–1114. eprint: Arxiv:2010.14277v1.

[250] R.E. Christiansen and O. Sigmund. "Inverse design in photonics by topology optimization: tutorial". In: *Journal of the Optical Society of America B* 38.2 (2021), pp. 496–509. eprint: arXiv:2008.11816v1.

[249] R.E. Christiansen and O. Sigmund. "Compact 200 line MATLAB code for inverse design in photonics by topology optimization: tutorial". In: *Journal of the Optical Society of America B* 38.2 (2021), pp. 510–520. eprint: arxiv.org/abs/2009.14276.

[248] F. Ferrari, O. Sigmund, and J.K. Guest. "Topology Optimization with linearized buckling criteria in 250 lines of Matlab". In: *Structural and Multidisciplinary Optimization* 63 (2021), pp. 3045–3066. eprint: arXiv.org/2101.02973.

[247] R. Giele, J. Groen, N. Aage, C.A. Andreasen, and O. Sigmund. "On approaches for avoiding low stiffness regions in variable thickness sheet and homogenization-based topology optimization". In: *Structural and Multidisciplinary Optimization* 64 (2021), pp. 39–52.

[246] J.P. Groen, C. Thomsen, and O. Sigmund. “Multi-scale topology optimization and de-homogenization using implicit geometry modeling”. In: *Structural and Multidisiciplinary Optimization* 63 (2021), pp. 2919–2934.

[245] D. Høj, F. Wang, W. Gao, U.B. Hoff, O. Sigmund, and U.L. Andersen. “Ultra-coherent nanomechanical resonators based on inverse design”. In: *Nature Communications* 12 (2021), p. 5766. eprint: `arXiv:2103.15601`.

[244] P Jensen, F Wang, I Dimino, and O Sigmund. “Topology Optimization of Large-Scale 3D Morphing Wingstructures”. In: *submitted* 10.9 (2021).

[243] P. Kumar, C. Schmidleithner, N. B. Larsen, and O. Sigmund. “Topology Optimization and 3D-printing of Large Deformation Compliant Mechanisms for Straining Biological Tissues”. In: *Structural and Multidisciplinary Optimization* 63 (2021), pp. 1351–1366.

[242] W. Li, F. Wang, O. Sigmund, and X.S. Zhang. “Design of composite structures with programmable elastic responses under finite deformations”. In: *Journal of the Mechanics and Physics of Solids* (2021), p. 104356.

[241] Q. Li, O. Sigmund, J.S. Jensen, and N. Aage. “Reduced-order methods for dynamic problems in topology optimization: a comparative study”. In: *Computer Methods in Applied Mechanics and Engineering* 387 (2021), p. 114149.

[240] R. Pejman, O. Sigmund, and A. Najafi. “Topology optimization of microvascular composites for active-cooling applications using a geometrical reduced-order model”. In: *Structual and Multidisciplinary Optimization* 64.2 (2021), pp. 563–583.

[239] G.A. da Silva, N. Aage, A.T. Beck, and O. Sigmund. “Three-dimensional manufacturing tolerant topology optimization with hundreds of millions of local stress constraints”. In: *International Journal for Numerical Methods in Engineering* 122.2 (2021). See also arXiv:2006.12927, pp. 548–578.

[238] G.A. da Silva, N. Aage, A.T. Beck, and O. Sigmund. “Local versus global stress constraint strategies in topology optimization: a comparative study”. In: *International Journal for Numerical Methods in Engineering* 122.21 (2021), pp. 6003–6036.

[237] E.Q. Träff, O. Sigmund, and N. Aage. “Topology Optimization of Ultra High Resolution Shell Structures”. In: *Thin-Walled Structures* 160 (2021), p. 107349.

[236] Y. Wang, J. Groen, and O. Sigmund. “Plate microstructures with extreme stiffness for arbitrary multi-loadings Corresponding”. In: *Computer Methods in Applied Mechanics and Engineering* 381 (2021), p. 113778.

[235] F. Wang and O. Sigmund. “3D architected isotropic materials with tunable stiffness and buckling strength”. In: *Journal of the Mechanics and Physics of Solids* 152 (2021). Online, p. 104415. eprint: `arXiv:2012.01359`.

[234] C. Wang, Z. Zhao, M. Zhou, O. Sigmund, and X.S. Zhang. “A comprehensive review of educational articles on structural and multidisciplinary optimization”. In: *Structural and Multidisciplinary Optimization* 64 (2021), 2827âĂŞ2880.

[233] K. Wu, O. Sigmund, and J. Du. “Design of metamaterial mechanisms using robust topology optimization and variable linking scheme”. In: *Structural and Multidisciplinary Optimization* 63 (4 2021), pp. 1975–1988.

[232] J. Wu, O. Sigmund, and J.P. Groen. “Topology Optimization of Multi-scale Structures: A Review”. In: *Structural and Multidisciplinary Optimization* 63 (2021), pp. 1455–1480.

[231] M. Zhou and O. Sigmund. “Complementary lecture notes for teaching the 99/88-line topology optimization codes”. In: *Structural and Multidisciplinary Optimization* 64 (2021), 3227âĂŞ3231.

[230] L. Zhou, O. Sigmund, and W. Zhang. “Self-supporting structure design with feature-driven optimization approach for additive manufacturing”. In: *Computer Methods in Applied Mechanics and Engineering* 386 (2021), p. 114110.

[229] M. Baandrup, O. Sigmund, H. Polk, and N. Aage. “Closing the gap towards super-long suspension bridges using computational morphogenesis”. In: *Nature Communications* 11 (2020), p. 2735.

[228] G.L. Bluhm, O. Sigmund, F. Wang, and K. Poulios. “Nonlinear compressive stability of hyperelastic 2D lattices at finite volume fractions”. In: *Journal of the Mechanics and Physics of Solids* 137 (2020), p. 103851.

[227] R.E. Christiansen, J. Michon, M. Benzaquia, O. Sigmund, and S.G. Johnson. “Inverse Design of Nanoparticles for Enhanced Raman Scattering”. In: *Optics Express* 28.4 (2020), pp. 4444–4462.

[226] J. Christiansen, J. Vester-Petersen, S. Roesgaard, S.H. Møller, R.E. Christiansen, O. Sigmund, S.P. Madsen, P. Balling, and B. Julsgaard. “Strongly enhanced upconversion in trivalent erbium ions by tailored gold nanostructures: toward high-efficient silicon-based photovoltaics”. In: *Solar Energy Materials and Solar Cells* 208 (2020), p. 110406.

[225] C. Conlan-Smith, N. Ramos-GarcÃ■a, O. Sigmund, and C.S. Andreasen. “Aerodynamic Shape Optimization of Aircraft Wings Using Panel Methods”. In: *AIAA Journal* 58.9 (2020), pp. 3765–3776.

[224] A. Evgrafov and O. Sigmund. “Sparse basis pursuit for compliance minimization in the vanishing volume ratio limit”. In: *ZAMM - Journal of Applied Mathematics and Mechanics* 100.9 (2020), e202000008.

[223] F. Ferrari and O. Sigmund. “Towards solving large scale topology optimization problems with buckling constraints at the cost of linear analyses”. In: *Computer Methods in Applied Mechanics and Engineering* 363 (2020), p. 112911.

[222] F. Ferrari and O. Sigmund. "A new generation 99 line Matlab code for compliance Topology Optimization and its extension to 3D". In: *Structural and Multidisciplinary Optimization* 62 (2020). Also arXiv:2005.05436, 2211âĂŞ2228.
[221] W. Gao, F. Wang, and O. Sigmund. "Systematic design of high-Q prestressed micro membrane resonators". In: *Computer Methods in Applied Mechanics and Engineering* 361 (2020), p. 112692.
[220] J.P. Groen, F.C. Stutz, N. Aage, J.A. Bærentzen, and O. Sigmund. "De-homogenization of optimal multiscale 3D topologies". In: *Computer Methods in Applied Mechanics and Engineering* 364 (2020), p. 112979.
[219] L.C. Høghøj, D.R. Nørhave, J. Alexandersen, O. Sigmund, and C.S. Andreasen. "Topology Optimization of Two Fluid Heat Exchangers". In: *International Journal of Heat and Mass Transfer* 163 (2020), p. 120543.
[218] J.K. LÃijdeker, O. Sigmund, and B. Kriegesmann. "Inverse homogenization using isogeometric shape optimization". In: *Computer Methods in Applied Mechanics and Engineering* 368 (2020), p. 113170.
[217] Y. Luo, O. Sigmund, Q. Li, and S. Liu. "Additive manufacturing oriented topology optimization ofstructures with self-supported enclosed voids". In: *Computer Methods in Applied Mechanics and Engineering* 372 (2020), p. 113385.
[216] S. Madsen et al. "Improving the efficiency of upconversion by light concentration using nanoparticle design". In: *Journal of Physics D: Applied Physics* 53 (2020), p. 073001.
[215] T Nguyen, J.A. Bærentzen, O. Sigmund, and N. Aage. "Efficient hybrid topology and shape optimization combining implicit and explicit design representations". In: *Structural and Multidisciplinary Optimization* 62 (2020), pp. 1061–1069.
[214] N. Pollini, O. Sigmund, C.S. Andreasen, and J. Alexandersen. "A "poor man's" approach for high-resolution three-dimensional topology optimization of natural convection problems". In: *Advances in Engineering Software* 140 (2020), p. 102736.
[213] Ole Sigmund. "EML webinar overview: Topology Optimization-Status and Perspectives". In: *Extreme Mechanics Letters* 39 (2020), p. 100855.
[212] F.C. Stutz, J.P. Groen, O. Sigmund, and J.A. Bærentzen. "Singularity Aware De-Homogenization for High-Resolution Topology Optimized Structures". In: *Structural and Multidisciplinary Optimization* 62 (2020), 2279âĂŞ2295.
[211] Y. Wang and O. Sigmund. "Quasiperiodic Mechanical Metamaterials with Extreme Isotropic Stiffness". In: *Extreme Mechanics Letters* 34 (2020), p. 100596.
[210] F. Wang and O. Sigmund. "Numerical investigation of stiffness and buckling of simple and optimized infill structures". In: *Structural and Multidisciplinary Optimization* 61 (2020), pp. 2629–2639.
[209] J. Asmussen, J. Alexandersen, O. Sigmund, and C.S. Andreasen. "A "poor man's" approach to topology optimization of natural convection problems". In: *Structural and Multidisciplinary Optimization* 59.4 (2019), pp. 1105–1124.
[208] R.E. Christiansen, F. Wang, O. Sigmund, and S. Stobbe. "Designing Photonic Topological Insulators with Quantum-Spin-Hall Edge States using Topology Optimization". In: *Nanophotonics* 8 (2019), pp. 1363–1369.
[207] R.E. Christiansen, F. Wang, and O. Sigmund. "Topological Insulators by Topology Optimization". In: *Physical Review Letters* 122 (23 2019), p. 234502.
[206] R.E. Christiansen, J. Vester-Petersen, S.P. Madsen, and O. Sigmund. "A non-linear material interpolation for design of metallic nano-particles using topology optimization". In: *Computer Methods in Applied Mechanics and Engineering* 343 (2019), pp. 23–29.
[205] F. Ferrari and O. Sigmund. "Revisiting topology optimization with buckling constraints". In: *Structural and Multidisciplinary Optimization* 59.5 (2019), pp. 1401–1415.
[204] J.P. Groen, J. Wu, and O. Sigmund. "Homogenization-based stiffness optimization and projection of 2D coated structures with orthotropic infill". In: *Computer Methods in Applied Mechanics and Engineering* 349 (2019). (also arXiv:1808.04740 August 2018), pp. 722–742.
[203] Y. Li, J. Zhu, F. Wang, W. Zhang, and O. Sigmund. "Shape preserving design of geometrically nonlinear structures using topology optimization". In: *Structural and Multidisciplinary Optimization* 59.4 (2019), pp. 1033–1051.
[202] C. Lundgaard and O. Sigmund. "Design of segmented off-diagonal thermoelectric generators using topology optimization". In: *Applied Energy* 236 (2019), pp. 950–960.
[201] C. Lundgaard and O. Sigmund. "Design of segmented thermoelectric Peltier coolers with topology optimization." In: *Applied Energy* 239 (2019), pp. 1003–1013.
[200] C. Lundgaard and O. Sigmund. "A density-based topology optimization methodology for thermal energy storage systems systems". In: *Structural and Multidisciplinary Optimization* 60 (2019), pp. 2189–2204.
[199] D.G. Nielsen, S.D. Pedersen, V. Zhurbenko, V.E. Johansen, O. Sigmund, and N. Aage. "Topology optimization and experimental verrification of compact E-plane waveguide filters". In: *Microwave and Optical Technology Letters* (2019), pp. 1–8.
[198] G.A. da Silva, A.T. Beck, and O. Sigmund. "Stress-constrained topology optimization considering uniform manufacturing uncertainties". In: *Computer Methods in Applied Mechanics and Engineering* 344 (2019), pp. 512–537.
[197] G.A. da Silva, A.T. Bech, and O. Sigmund. "Topology optimization of compliant mechanisms with stress constraints and manufacturing error robustness". In: *Computer Methods in Applied Mechanics and Engineering* 354 (2019), pp. 397–421.

[196] E. Träff, O. Sigmund, and J.P. Groen. "Simple single-scale microstructures based on rank-3 optimal laminates". In: *Structural and Multidisciplinary Optimization* 59.4 (2019), pp. 1021–1031.
[195] S. Yan, F. Wang, J. Hong, and O. Sigmund. "Topology optimization of microchannel heat sinks using a two-layer model". In: *International Journal of Heat and Mass Transfer* 143 (2019), p. 118462.
[194] Y. Wang, J.P. Groen, and O. Sigmund. "Simple optimal lattice structures for arbitrary loadings". In: *Extreme Mechanics Letters* 29 (2019), p. 100447.
[193] J. Alexandersen, O. Sigmund, K.E. Meyer, and B.S. Lazarov. "Design of passive coolers for light-emitting diode lamps using topology optimisation". In: *International Journal of Heat and Mass Transfer* 122 (2018), pp. 138–149.
[192] E. Andreassen, F. Ferrari, O. Sigmund, and A.R. Diaz. "Frequency response as a surrogate eigenvalue problem in topology optimization". In: *International Journal for Numerical Methods in Engineering* 113.8 (2018), pp. 1214–1229.
[191] P. Balling et al. "Improving the efficiency of solar cells by upconverting sunlight using field enhancement from optimized nano structures". In: *Optical Materials* 83 (2018), pp. 279 –289.
[190] C. Dilgen, S.B. Dilgen, D.R. Fuhrman, O. Sigmund, and B.S. Lazarov. "Topology Optimization of Turbulent Flows". In: *Computer Methods in Applied Mechanics and Engineering* 331 (2018), pp. 363–393.
[189] C. Dilgen, S.B. Dilgen, D.R. Fuhrman, O. Sigmund, and B.S. Lazarov. "Density Based Topology Optimization of Turbulent Flow Heat Transfer Systems". In: *Structural and Multidisciplinary Optimization* 57.5 (2018), pp. 1905–1918.
[188] E.H. Eriksen, A. Nazir, Balling P., J. Vester-Petersen, R.E. Christiansen, O. Sigmund, and S.P. Madsen. "Dose regularization via filtering and projection: an open-source code for optimization-based proximity-effect-correction for nanoscale lithography". In: *Microelectronic Engineering* 199 (2018), pp. 52–57.
[187] F. Ferrari, B. Lazarov, and O. Sigmund. "Eigenvalue topology optimization via efficient multilevel solution of the Frequency Response". In: *International Journal for Numerical Methods in Engineering* 115 (7 2018), pp. 872–892.
[186] J.P. Groen and O. Sigmund. "Homogenization-based topology optimization for high-resolution manufacturable microstructures". In: *International Journal for Numerical Methods in Engineering* 113.8 (2018). (online since April 2017), pp. 1148–1163.
[185] J.H.K. Haertel, K. Engelbrecht, B. Lazarov, and O. Sigmund. "Topology Optimization of a Pseudo 3D Thermofluid Heat Sink Model". In: *International Journal of Heat and Mass Transfer* 121 (2018), pp. 1073 –1088.
[184] T. Lei, J. Alexandersen, B.S. Lazarov, F. Wang, J.H.K. Haertel, S. De Angelis, S. Sanna, O. Sigmund, and K. Engelbrecht. "Investment casting and experimental testing of heat sinks designed by topology optimization". In: *International Journal of Heat and Mass Transfer* 127 (2018), pp. 396–412.
[183] S.D. Larsen, O. Sigmund, and J.P. Groen. "Optimal truss and frame design from projected homogenization-based topology optimization". In: *Structural and Multidisciplianry Optimization* 57.4 (2018), pp. 1461–1474.
[182] J.R. De Lasson et al. "Benchmarking five numerical simulation techniques for computing resonance wavelengths and quality factors in photonic crystal membrane line defect cavities". In: *Optics Express* 26.9 (2018), pp. 11366–11392.
[181] B.S. Lazarov, O. Sigmund, K.E. Meyer, and J. Alexandersen. "Experimental validation of additively manufactured optimized shapes for passive cooling". In: *Applied Energy* 226 (2018), pp. 330–339.
[180] C. Lundgaard, J. Alexandersen, M. Zhou, C.S. Andreasen, and O. Sigmund. "Revisiting density-based topology optimization for fluid-structure-interaction problems". In: *Structural and Multidisciplinary Optimization* 58.3 (2018), pp. 969–995.
[179] C. Lundgaard, R. Bjørk, and O. Sigmund. "Topology optimization of segmented thermoelectric generators". In: *Journal of Electronic Materials* 47.12 (2018), pp. 6959–6971.
[178] C. Lundgaard and O. Sigmund. "A density-based topology optimization methodology for thermoelectric energy conversion problems". In: *Structural and Multidisciplinary Optimization* 57.4 (2018), pp. 1427–1442.
[177] D. Ruiz, A. Diaz-Molina, O. Sigmund, A. Donoso, J. Carlos Bellido, and J. Luis Sanchez-Rojas. "Optimal design of robust piezoelectric unimorph microgrippers". In: *Applied Mathematical Modelling* 55 (2018), pp. 1 –12.
[176] D. Ruiz and O. Sigmund. "Optimal design of robust piezoelectric microgrippers undergoing large displacements". In: *Structural and Multidisciplinary Optimization* 57 (2018), pp. 71–82.
[175] C.R. Thomsen, F. Wang, and O. Sigmund. "Buckling strength topology optimization of 2D periodic materials based on linearized bifurcation analysis". In: *Computer Methods in Applied Mechanics and Engineering* 339 (2018), pp. 115–136.
[174] J. Vester-Petersen, S.P. Madsen, O. Sigmund, P. Balling, B. Julsgaard, and R.E. Christiansen. "Field-enhancing photonic devices utilizing waveguide coupling and plasmonics - a selection rule for optimization-based design". In: *Optics Express* 26.18 (2018), A788–A795.
[173] F. Wang, R.E. Christiansen, Y. Yu, J. Mørk, and O. Sigmund. "Maximizing the quality factor to mode volume ratio for ultra-small photonic crystal cavities". In: *Applied Physics Letters* 113.24 (2018), p. 241101.

[172] J. Wu, N. Aage, R. Westermann, and O. Sigmund. "Infill Optimization for Additive Manufacturing – Approaching Bone-like Porous Structures". In: *IEEE Transactions on Visualization and Computer Graphics* 24.2 (2018). Online since January 17th, 2017, pp. 1127–1140.

[171] S. Yan, F. Wang, and O. Sigmund. "On the non-optimality of tree structures for heat conduction". In: *International Journal of Heat and Mass Transfer* 122 (2018), pp. 660–680.

[170] X. Zhao, M. Zhou, O. Sigmund, and C.S. Andreasen. "A "poor man's approach" to topology optimization of cooling channels based on a Darcy flow model". In: *International Journal of Heat and Mass Transfer* 116 (2018), pp. 1108–1123.

[169] M. Zhou, H. Liang, O. Sigmund, and N. Aage. "Shape morphing and topology optimization of fluid channels by explicit boundary tracking". In: *International Journal for Numerical Methods in Fluids* 88.6 (2018), pp. 296–313.

[168] N. Aage, E. Andreassen, B.S. Lazarov, and O. Sigmund. "Giga-voxel computational morphogenesis for structural design". In: *Nature* 550 (2017), pp. 84–86.

[167] A. Clausen, E. Andreassen, and O. Sigmund. "Topology optimization of 3D shell structures with porous infill". In: *Acta Mechanica Sinica* 33.4 (2017), pp. 778–791.

[166] J.P. Groen, M. Langelaar, O. Sigmund, and M. Ruess. "Higher-order multi-resolution topology optimization using the finite cell method". In: *International Journal for Numerical Methods in Engineering* 110 (2017), pp. 903–920.

[165] H. Lian, A.N. Christiansen, D.A. Tortorelli, N. Aage, and O. Sigmund. "Combined Shape and Topology Optimization for Minimization of Maximal von Mises Stress". In: *Structural and Multidisciplinary Optimization* 55.5 (2017), pp. 1541–1557.

[164] S. Rojas-Labanda, O Sigmund, and M. Stolpe. "A short numerical study on the optimization methodsinfluence on topology optimization". In: *Strucural and Multidisciplinary Optimization* 56 (2017), pp. 1603–1612.

[163] B. Song, V.E. Johansen, O. Sigmund, and J.H. Shin. "Reproducing the hierarchy of disorder for Morpho-inspired, broad-angle color reflection". In: *Scientific Reports* 7 (2017), p. 46023.

[162] J. Vester-Petersen, R.E. Christiansen, B. Julsgaard, P. Balling, O. Sigmund, and S. Madsen. "Topology Optimized Gold Nanostrips for Enhanced Near-infrared Photon Upconversion". In: *Applied Physics Letters* 111 (2017), p. 133102.

[161] J. Wu, A. Clausen, and O. Sigmund. "Topology Optimization of Shell-Infill Composites for Additive Manufacturing". In: *Computer Method in Applied Mechanics and Engineering* 326 (2017), pp. 358–375.

[160] M. Zhou, B.S. Lazarov, and O. Sigmund. "Topology optimization for optical microlithography with partially coherent illumination". In: *International Journal for Numerical Methods in Engineering* 109.5 (2017), pp. 631–647.

[159] M. Zhou and O. Sigmund. "On fully stressed design and P-norm measures in structural optimization". In: *Structural and Multidisciplinary Optimization* 56.3 (2017), pp. 731–736.

[158] J. Alexandersen, O. Sigmund, and N. Aage. "Large scale three-dimensional topology optimisation of heat sinks cooled by natural convection". In: *International Journal of Heat and Mass Transfer* 100 (2016), pp. 876 –891.

[157] R.E. Christiansen and O. Sigmund. "Designing Meta Material Slabs Exhibiting Negative Refraction Using Topology Optimization". In: *Structural and Multidisciplinary Optimization* 54.3 (2016), pp. 469–482.

[156] R.E. Christiansen and O. Sigmund. "Experimental validation of systematically designed acoustic hyperbolic meta material slab exhibiting negative refraction". In: *Applied Physics Letters* 109.10, 101905 (2016), p. 101905.

[155] A. Clausen, N. Aage, and O. Sigmund. "Exploiting Additive Manufacturing Infill in Topology Optimization for Improved Buckling Load". In: *Engineering* 2 (2016), pp. 250–257.

[154] A. Donoso and O. Sigmund. "Topology optimization of piezo modal transducers with null-polarity phases". In: *Structural and Multidisciplinary Optimization* 53.2 (2016), pp. 193–203.

[153] L.F. Frellsen, Y. Ding, O. Sigmund, and L.H. Frandsen. "Topology optimized mode multiplexing in silicon-on-insulator photonic wire waveguides". In: *Optics Express* 24.15 (2016), pp. 16866–16873.

[152] B.S. Lazarov, F. Wang, and O. Sigmund. "Length scale and manufacturability in density-based topology optimization". In: *Archives of Applied Mechanics* 86 (2016), pp. 189–218.

[151] S. Madsen, N.P. Langea, L. Giuliani, B.S. Jomaas G. Lazarov, and O. Sigmund. "Topology Optimization for Simplified Structural Fire Safety". In: *Computers and Structures* 124 (2016), pp. 333–343.

[150] M. Nobel-Jørgensen, D. Malmgren-Hansen, J.A. Bærentzen, O. Sigmund, and N. Aage. "Improving topology optimization intuition through games". In: *Structural and Multidisciplinary Optimization* 54.4 (2016), pp. 775–781.

[149] S. Nørgaard, O. Sigmund, and B.S. Lazarov. "Topology optimization of unsteady flow problems using the lattice Boltzmann method". In: *Journal of Computational Physics* 307 (2016), pp. 291–307.

[148] M. Schevenels and O. Sigmund. "On the implementation and effectiveness of morphological close-open and open-close filters for topology optimization". In: *Structural and Multidisciplinary Optimization* 54 (2016), pp. 15–21.

[147] O. Sigmund, N. Aage, and E. Andreassen. "On the (non-)optimality of Michell structures". In: *Structural and Multidisciplinary Optimization* 54 (2016), pp. 361–372.

[146] O. Sigmund, J.S. Jensen, and L.H. Frandsen. "On nanostructured silicon success". In: *Nature Photonics* 10.3 (2016), pp. 142–143.
[145] S. Soprani, J.H. : Haertel, B.S. Lazarov, O. Sigmund, and K. Engelbrecht. "Topology Optimization of Integrated Thermoelectric Cooling Systems for Downhole Electronics". In: *Applied Energy* 176 (2016), pp. 49–64.
[144] C. Van Hoorickx, O. Sigmund, M. Schevenels, B.S. Lazarov, and G. Lombaert. "Topology optimization of two-dimensional elastic wave barriers". In: *Journal of Sound and Vibration* 376 (2016), pp. 95–111.
[143] M. Zhou, J. Alexandersen, O. Sigmund, and C.B.W. Pedersen. "Industrial Application of Topology Optimization for Combined Conductive and Convective Heat Transfer Problems". In: *Structural and Multidisciplinary Optimization* 54 (2016), pp. 1045–1060.
[142] A.N. Christiansen, J.A. Bærentzen, M. Nobel-Jørgensen, N. Aage, and O. Sigmund. "Combined shape and topology optimization of 3D structures". In: *Computers & Graphics* 46 (2015), pp. 25 –35.
[141] V.E. Johansen, L.H. Thamdrup, K. Smistrup, T. Nielsen, O. Sigmund, and P. Vukusic. "Designing visual appearance using a structured surface". In: *Optica* 2.3 (2015), pp. 239–245.
[140] M. Nobel-Jørgensen, N. Aage, A.N Christiansen, T. Igarashi, J.A. Bærentzen, and O. Sigmund. "3D interactive topology optimization on hand-held devices". In: *Structural and Multidisciplinary Optimization* 51.6 (2015), pp. 1385–1391.
[139] M. Zhou, B.S. Lazarov, F. Wang, and O. Sigmund. "Minimum length scale in topology optimization by geometric constraints". In: *Computer Methods in Applied Mechanics and Engineering* 293 (2015), pp. 266–282.
[138] R.E. Christiansen, E.F. Grande, and O. Sigmund. "Experimental Validation of Topology Optimized Acoustic Cavity". In: *Journal of the Acoustical Society of America* 138.6 (2015), p. 3470.
[137] A. Clausen, N. Aage, and O. Sigmund. "Topology optimization of coated structures and material interface problems". In: *Computer Methods in Applied Mechanics and Engineering* 290 (2015), pp. 524–541.
[136] A. Clausen, F. Wang, J.S. Jensen, O. Sigmund, and J.A. Lewis. "Topology Optimized Architectures with Programmable Poisson's Ratio over Large Deformations". In: *Advanced Materials* 27.37 (2015), pp. 5523–5527.
[135] R.E. Christiansen, B.S. Lazarov, J.S. Jensen, and O. Sigmund. "Creating geometrically robust designs for highly sensitive problems using topology optimization". In: *Structural and Multidisciplinary Optimization* 52.4 (2015), pp. 737–754.
[134] D.M. De Leon, J. Alexandersen, J.S.O. Fonseca, and O. Sigmund. "Stress-constrained topology optimization for compliant mechanism design". In: *Structural and Multidisciplinary Optimization* 52.5 (2015), pp. 929–943.
[133] J. Alexandersen, N. Aage, C.S. Andreasen, and O. Sigmund. "Topology optimisation for natural convection problems". In: *International Journal for Numerical Methods in Fluids* 76 (2014), pp. 699–721.
[132] C.S. Andreasen, E. Andreassen, J.S. Jensen, and O. Sigmund. "On the realization of the bulk modulus bounds for two phase viscoelastic composites". In: *Journal of the Mechanics and Physics of Solids* 63 (2014), pp. 228–241.
[131] J. Andkjær, V.E. Johansen, K. S. Friis, and O. Sigmund. "Inverse design of nano-structured surfaces for color effects". In: *Journal of the Optical Society of America B* 31.1 (2014), pp. 164–174.
[130] E. Andreassen, B. Lazarov, and O. Sigmund. "Design of manufacturable 3D extremal elastic microstructure". In: *Mechanics of Materials* 69.1 (2014), pp. 1–10.
[129] A. Clausen, N. Aage, and O. Sigmund. "Topology Optimization with Flexible Void Area". In: *Structural and Multidisciplinary Optimization* 50.6 (2014), pp. 927–943.
[128] A.N. Christiansen, M. Nobel-Jørgensen, N. Aage, O. Sigmund, and J.A. Bærentzen. "Topology optimization using an explicit interface representation". In: *Structural and Multidisciplinary Optimization* 49 (2014), pp. 387–399.
[127] Y. Elesin, B.S. Lazarov, J.S. Jensen, and O. Sigmund. "Time domain topology optimization of 3D nanophotonic devices". In: *Photonics and Nanostructures - Fundamentals and Applications* 12.1 (2014), pp. 23–33.
[126] L.H. Frandsen, Y. Elesin, L.F. Frellsen, M. Mitrovic, Y. Ding, O. Sigmund, and K. Yvind. "Topology optimized mode conversion in a photonic crystal waveguide fabricated in silicon-on-insulator material". In: *Optics Express* 22.7 (2014), pp. 8525–8532.
[125] M. Jansen, G. Lombaert, M. Schevenels, and O. Sigmund. "Topology optimization of fail-safe structures using a simplified local damage model". In: *Structural and Multidisciplinary Optimization* 49 (2014), pp. 657–666.
[124] V.E. Johansen, J. Andkjær, and O. Sigmund. "Design of structurally colored surfaces based on scalar diffraction theory". In: *Journal of the Optical Society of America B* 31.2 (2014). (see also spotlight article http://www.opticsinfobase.org/spotlight/summary.cfm?uri=josab-31-2-207), pp. 207–217.
[123] F. Wang, B.S. Lazarov, O. Sigmund, and J.S. Jensen. "Interpolation scheme for fictitious domain techniques and topology optimization of finite strain elastic problems". In: *Computer Methods in Applied Mechanics and Engineering* 276 (2014), pp. 453–472.
[122] F. Wang, O. Sigmund, and J.S. Jensen. "Design of materials with prescribed nonlinear properties". In: *Journal of the Mechanics and Physics of Solids* 69 (2014), pp. 156–174.

[121] M. Zhou, B.S. Lazarov, and O. Sigmund. "Topology optimization for optical projection lithography with manufacturing uncertainties". In: *Applied Optics* 53 (2014), pp. 2720–2729.
[120] N. Aage, M. Nobel-Jørgensen, C.S. Andreasen, and O. Sigmund. "Interactive topology optimization on hand-held devices". In: *Structural and Multidisciplinary Optimization* 47 (2013), pp. 1–6.
[119] C.S. Andreasen and O. Sigmund. "Topology optimization of fluid-structure-interaction problems in poroelasticity". In: *Computer Methods in Applied Mechanics and Engineering* 258 (2013), pp. 55–62.
[118] J. Andkjær and O. Sigmund. "Topology Optimized Cloak for Airborne Sound". In: *Journal of Vibrations and Acoustics* 135.4 (2013), p. 041011.
[117] O. Amir and O. Sigmund. "Reinforcement layout design for concrete structures based on continuum damage and truss topology optimization". In: *Structural and Multidisciplinary Optimization* 47.2 (2013), pp. 157–174.
[116] S. Arslanagic, T.V. Hansen, N.A. Mortensen, A.H. Gregersen, O. Sigmund, R.W. Ziolkowski, and O. Breinbjerg. "A Review of the Scattering-Parameter Extraction Method with Clarification of Ambiguity Issues in Relation to Metamaterial Homogenization". In: *IEEE Antennas and Propagation Magazine* 55.2 (2013), pp. 91–106.
[115] M.B. Dühring and O. Sigmund. "Optimization of extraordinary optical absorption in plasmonic and dielectric structures". In: *Journal of the Optical Society of America B: Optical Physics* 30.5 (2013), pp. 1154–1160.
[114] M. Jansen, B.S. Lazarov, M. Schevenels, and O. Sigmund. "On the similarities between micro/nano lithography and topology optimization projection methods". In: *Structural and Multidisciplinary Optimization* 48.4 (2013), pp. 717–730.
[113] M. Jansen, G. Lombaert, M. Diehl, B. S. Lazarov, O. Sigmund, and M. Schevenels. "Robust topology optimization accounting for misplacement of material". In: *Structural and Multidisciplinary Optimization* 47 (2013), pp. 317–333.
[112] M. A. Philippine, O. Sigmund, G. M. Rebeiz, and T. W. Kenny. "Topology Optimization of Stressed Capacitive RF MEMS Switches". In: *IEEE Journal of Microelectromechanical Systems* 22.1 (2013), pp. 206–215.
[111] M.A. Philippine, H. Zareie, O. Sigmund, G.M. Rebeiz, and T.W. Kenny. "Experimental Validation of Topology Optimization For RF MEMS Capacitive Switch Design". In: *IEEE Journal of Microelectromechanical Systems* 22.6 (2013), pp. 1296–1309.
[110] O. Sigmund and K. Maute. "Topology optimization approaches: A comparative review". In: *Structural and Multidisciplinary Optimization* 48 (2013), pp. 1031–1055.
[109] B.-U. Park, Y.-D. Seo, O. Sigmund, and S.-K. Youn. "Shape optimization of the stokes flow problem based on isogeometric analysis". In: *Structural and Multidisciplinary Optimization* 48 (2013), pp. 965–977.
[108] X. Qian and O. Sigmund. "Topological design of electromechanical actuators with robustness toward over- and under-etching". In: *Computer Methods in Applied Mechanics and Engineering* 253 (2013), pp. 237–251.
[107] O. Amir, O. Sigmund, B.S. Lazarov, and M. Schevenels. "Efficient reanalysis techniques for robust topology optimization". In: *Computer Methods in Applied Mechanics and Engineering* 245-246.0 (2012), pp. 217–231.
[106] C.S. Andreasen and O. Sigmund. "Multiscale modeling and topology optimization of poroelastic actuators". In: *Smart Materials and Structures* 21.6 (2012), p. 065005.
[105] J Andkjær, N.A. Mortensen, and O Sigmund. "Effect of polarization and background material for low-contrast, all-dielectric optical cloaks". In: *Applied Physics Letters* 100 (2012), p. 101106.
[104] J. Andkjær, N.A. Mortensen, and O. Sigmund. "Towards all-dielectric, polarization-independent optical cloaks". In: *Applied Physics Letters* 100.10 (2012).
[103] M.B. Dühring, N.A. Mortensen, and O. Sigmund. "Plasmonic versus dielectric enhancement in thin-film solar cells". In: *Applied Physics Letters* 100 (2012), p. 211914.
[102] Y. Elesin, B. S. Lazarov, J. S. Jensen, and O. Sigmund. "Design of robust and efficient photonic switches using topology optimization". In: *Photonics and Nanostructures* 10 (2012), pp. 153–165.
[101] K. S. Friis and O. Sigmund. "Robust topology design of periodic grating surfaces". In: *Journal of the Optical Society of America B* 29.10 (2012), pp. 2935–2943.
[100] J. Grgić, J.R. Ott, F. Wang, O. Sigmund, Jauho A.-P., J. Mørk, and N.A. Mortensen. "Fundamental limitations to gain enhancement in periodic media and waveguides". In: *Physical Reveiw Letters* 108 (18 2012), p. 183903.
[99] B.S. Lazarov, M. Schevenels, and O. Sigmund. "Topology optimization considering material and geometric uncertainties using sparse grid stochastic collocation method". In: *Structural and Multidisciplinary Optimization* 46 (2012), pp. 597–612.
[98] M. Otomori, J. Andkjær, O. Sigmund, K. Izui, and S. Nishiwaki. "Inverse design of dielectric materials by topology optimization". In: *Progress in Electromagnetics Research (PIER)* 127 (2012), pp. 93–120.
[97] O. Sigmund and K. Maute. "Sensitivity filtering from a continuum mechanics perspective". In: *Structural and Multidisciplinary Optimization* 46.4 (2012), pp. 471–475.
[96] F. Wang, J. S. Jensen, J. Mørk, and O. Sigmund. "Systematic design of loss-engineered slow-light waveguides". In: *Journal of the Optical Society of America, A Optical Sciences* 29.12 (2012), pp. 2657–2666.

[95] F. Wang, J.S. Jensen, and O. Sigmund. "High-performance slow light photonic crystal waveguides with topology optimized or circular-hole based material layouts". In: *Photonics and Nanostructures - Fundamentals and Applications* 10.4 (2012), pp. 378–388.
[94] O. Amir and O. Sigmund. "On reducing computational effort in topology optimization: How far can we go?" In: *Structural and Multidisciplinary Optimization* 44.1 (2011), pp. 25–29.
[93] E. Andreassen, A. Clausen, M. Schevenels, B. Lazarov, and O. Sigmund. "Efficient topology optimization in MATLAB using 88 lines of code". In: *Structural and Multidisciplinary Optimization* 43 (1 2011). MATLAB code available online at: www.topopt.dtu.dk, pp. 1–16.
[92] J. Andkjær and O. Sigmund. "Topology optimized low-contrast all-dielectric optical cloak". In: *Applied Physics Letters* 98.2 (2011), p. 021112.
[91] C.S. Andreasen and O. Sigmund. "Saturated poroelastic actuators generated by topology optimization". In: *Structural and multidisciplinary optimization* 43.5 (2011), pp. 693–706.
[90] A. Erentok and O. Sigmund. "Topology Optimization of Sub-Wavelength Antennas". In: *IEEE Transactions on Antennas and Propagation* 59.1 (2011), pp. 58–69.
[89] A.R. Gersborg and O. Sigmund. "Maximizing opto-mechanical interaction using topology optimization". In: *International journal for numerical methods in engineering* 87.9 (2011), pp. 822–843.
[88] J. S. Jensen and O. Sigmund. "Topology optimization for nano-photonics". In: *Laser & Photonics Reviews* 5.2 (2011), pp. 308–321.
[87] B.S. Lazarov, M. Schevenels, and O. Sigmund. "Robust design of large-displacement compliant mechanisms". In: *Mechanical Sciences* 2 (2011), pp. 175–182. URL: `www.mech-sci.net/2/175/2011`.
[86] B.S. Lazarov, M. Schevenels, and O. Sigmund. "Topology optimization with geometric uncertainties by perturbation techniques". In: *International Journal for Numerical Methods in Engineering* 90.11 (2012), pp. 1321–1336.
[85] B. Lazarov and O. Sigmund. "Factorized parallel preconditioner for the saddle point problem". In: *International Journal for Numerical Methods in Biomedical Engineering* 27 (2011), pp. 1398–1410.
[84] B. Lazarov and O. Sigmund. "Filters in topology optimization as a solution to Helmholtz type differential equation". In: *International Journal for Numerical Methods in Engineering* 86.6 (2011), pp. 765–781.
[83] R Matzen, J.S. Jensen, and O. Sigmund. "Topology optimization of slow light structures in the time domain". In: *Journal of the Optical Society of America B* 28.10 (2011), pp. 2374–2382.
[82] R. Piat, Y. Sinchuk, M. Vasoya, and O. Sigmund. "Minimal compliance design for metal-ceramic composites based structures". In: *Acta Materialia* 59.12 (2011), pp. 4835–4846.
[81] X. Qian and O. Sigmund. "Isogeometric shape optimization of photonic crystals via Coons patches". In: *Computer Methods in Applied Mechanics and Engineering* 200.25–28 (2011), pp. 2237–2255.
[80] M. Schevenels, B.S Lazarov, and O. Sigmund. "Robust topology optimization accounting for spatially varying manufacturing errors". In: *Computer Methods in Applied Mechanics and Engineering* 200.49-52 (2011), pp. 3613–3627.
[79] O. Sigmund. "On the usefulness of non-gradient approaches in topology optimization". In: *Structural and Multidisciplinary Optimization* 43.5 (2011), pp. 589–596.
[78] F. Wang, J.S. Jensen, and O. Sigmund. "Robust topology optimization of photonic crystal waveguides with tailored dispersion properties". In: *Journal of the Optical Society of America B: Optical Physics* 28.3 (2011), pp. 387–397.
[77] F. Wang, B.S. Lazarov, and O. Sigmund. "On projection methods, convergence and robust formulations in topology optimization". In: *Structural and Multidisciplinary Optimization* 43.6 (2011), pp. 767–784.
[76] N. Aage, N.A. Mortensen, and O. Sigmund. "Topology optimization of metallic devices for microwave applications". In: *International Journal for Numerical Methods in Engineering* 83.2 (2010), pp. 228–248.
[75] O. Amir, M. Stolpe, and O. Sigmund. "Efficient Use of Iterative Solvers in Nested Topology Optimization". In: *Structural and Multidisciplinary Optimization* 42.1 (2010), pp. 55–72.
[74] J.A. Andkjær, S. Nishiwaki, T. Nomura, and O. Sigmund. "Topology optimization of grating couplers for the efficient excitation of surface plasmons". In: *JOSA B* 27.9 (2010), pp. 1828–1832.
[73] A.R. Diaz and O. Sigmund. "A Topology Optimization Method for Design of Negative Permeability Metamaterials". In: *Structural and Multidisciplinary Optimization* 41.2 (2010), pp. 163–177.
[72] M. B. Dühring, O. Sigmund, and T. Feurer. "Design of photonic-bandgap fibers by topology optimization". In: *Journal of the Optical Society of America B: Optical Physics* 27 (2010), pp. 51–58.
[71] A.R. Gersborg and O. Sigmund. "Extreme non-linear elasticity and transformation optics". In: *Optics Express* 18 (2010), pp. 19020–19031.
[70] R. Matzen, J.S. Jensen, and O. Sigmund. "Topology Optimization for Transient Response of Photonic Crystal Structures". In: *Journal of the Optical Society of America B* 27.10 (2010), pp. 2040–2050.
[69] A. Mortensen, M. Yan, O. Sigmund, and O. Breinbjerg. "On the unambiguous determination of effective optical properties of periodic metamaterials: a one-dimensional case study". In: *European Optical Society : Rapid Publications* 5 (2010), p. 10010.
[68] A. Donoso and O. Sigmund. "Optimization of piezoelectric bimorph actuators with active damping for static and dynamic loads". In: *Structural and Multidisciplinary Optimization* 38.2 (2009), pp. 171–183.
[67] M. B. Dühring and O. Sigmund. "Improving the acousto-optical interaction in a Mach-Zehnder interferometer". In: *Journal of Applied Physics* 105 (2009), p. 083529.

[66] A. A. Larsen, B. Laksafoss, J. S. Jensen, and O. Sigmund. "Topological material layout in plates for vibration suppression and wave propagation control". In: *Structural and Multidisciplinary Optimization* 37.6 (2009), pp. 585–594.
[65] N.A. Mortensen, O. Sigmund, and O. Breinbjerg. "Prospects for poor-man's cloaking with low-contrast all-dielectric optical elements". In: *Journal of the European Optical Society, Rapid Publications* 4 (2009), p. 09008.
[64] O. Sigmund. "Manufacturing tolerant topology optimization". In: *Acta Mechanica Sinica* 25.2 (2009), pp. 227–239.
[63] O. Amir, M. P. Bendsøe, and O. Sigmund. "Approximate Reanalysis in Topology Optimization". In: *International journal for numerical methods in engineering* 78.12 (2009), pp. 1474–1491.
[62] C. S. Andreasen, A. R. Gersborg, and O. Sigmund. "Topology optimization of microfluid mixers". In: *International Journal for Numerical Methods in Fluids* 61.5 (2009), pp. 498–513.
[61] L. Yang, A. V. Lavrinenko, J. M. Hvam, and O. Sigmund. "Design of one-dimensional optical pulse-shaping filters by time-domain topology optimization". In: *Applied Physics Letters* 95 (2009), p. 261101.
[60] N. Aage, T. H. Poulsen, A. Gersborg-Hansen, and O. Sigmund. "Topology Optimization of Large Scale Stokes Flow Problems". In: *Structural and Multidisciplinary Optimization* 35 (2008), pp. 175–180.
[59] J. Dahl, J. S. Jensen, and O. Sigmund. "Topology optimization for transient problems in one dimension: Design of filters and pulse modulators". In: *Structural and Multidisciplinary Optimization* 36 (2008), pp. 585–595.
[58] M.B. Dühring, J.S. Jensen, and O. Sigmund. "Acoustic design by topology optimization". In: *Journal of Sound and Vibration* 317 (2008), pp. 557–575.
[57] J. Riishede and O. Sigmund. "Inverse Design of Dispersion Compensating Optical Fibres Using Topology Optimization". In: *Journal of the Optical Society of America B: Optical Physics* 25.1 (2008), pp. 88–97.
[56] Ö. Sardan, V. Eichhorn, D. H. Petersen, S. Fatikow, O. Sigmund, and P. Bøggild. "Rapid prototyping of nanotube-based devices using topology-optimized microgrippers". In: *Nanotechnology* 19.49 (2008), p. 495503.
[55] Ö. Sardan, D. H. Petersen, K. Mølhave, O. Sigmund, and P. Bøggild. "Topology optimized electrothermal polysilicon microgrippers". In: *Microelectronics Engineering* 85 (2008), pp. 1096–1099.
[54] O. Sigmund and K. Hougaard. "Geometrical properties of optimal photonic crystals". In: *Physical Review Letters* 100.15 (2008), p. 153904.
[53] G. H. Yoon and O. Sigmund. "A monolithic approach for topology optimization of electrostatically actuated devices". In: *Computer Methods in Applied Mechanics and Engineering* 197 (2008), pp. 4062–4075.
[52] P.I. Borel, B. Bilenberg, L.H. Frandsen, T. Nielsen, J. Fage-Pedersen, A.V. Lavrinenko, J.S. Jensen, O. Sigmund, and A. Kristensen. "Imprinted silicon-based nanophotonics". In: *Optics Express* 15.3 (2007), pp. 1261–1266.
[51] R. Stainko and O. Sigmund. "Tailoring dispersion properties of photonic crystal waveguides by topology optimization". In: *Waves in Random and Complex Media* 17 (2007), pp. 477–489.
[50] O. Sigmund and P.M. Clausen. "Topology optimization using a mixed formulation: An alternative way to solve pressure load problems". In: *Computer Methods in Applied Mechanics and Engineering* 196.13-16 (2007), pp. 1874–1889.
[49] O. Sigmund. "Morphology-based black and white filters for topology optimization". In: *Structural and Multidisciplinary Optimization* 33.4-5 (2007), pp. 401–424.
[48] G. H. Yoon, J. S. Jensen, and O. Sigmund. "Topology Optimization for Acoustic Structure Interaction Problems". In: *International Journal for Numerical Methods in Engineering* 70.9 (2007), pp. 1049–1075.
[47] S. Halkjær, O. Sigmund, and J.S. Jensen. "Maximizing band gaps in plate structures". In: *Structural and Multidisciplinary Optimization* 32.4 (2006), pp. 263–275.
[46] A. Gersborg-Hansen, M. P. Bendsøe, and O. Sigmund. "Topology optimization of heat conduction problems using the finite volume method". In: *Structural and Multidisciplinary Optimization* 31 (2006), pp. 251–259.
[45] N. Ikeda et al. "Topology optimised photonic crystal waveguide intersections with high-transmittance and low crosstalk". In: *Electronics Letters* 42.18 (2006), pp. 1031–1033.
[44] K. Asakawa et al. "Photonic crystal and quantum dot technologies for all-optical switch and logic device". English. In: *New Journal of Physics* 8.208 (2006), pp. 1–26.
[43] M. P. Bendsøe, E. Lund, N. Olhoff, and O. Sigmund. "Topology Optimization – Broadening the Areas of Application". In: *Control and Cybernetics* 34.1 (2005), pp. 7–35.
[42] P. I. Borel, L. H. Frandsen, A. Harpøth, M. Kristensen, J. S. Jensen, and O. Sigmund. "Topology Optimised Broadband Photonic Crystal Y-Splitter". In: *Electronics Letters* 41.2 (2005), pp. 69–71.
[41] A. Gersborg-Hansen, O. Sigmund, and R. B. Haber. "Topology Optimization of Channel Flow Problems". In: *Structural and Multidisciplinary Optimization* 30.3 (2005), pp. 181–192.
[40] S. Halkjær, O. Sigmund, and J. S. Jensen. "Inverse Design of Phononic Crystals by Topology Optimization". In: *Zeitschrifft fur Kristallographie* 220.9-10 (2005), pp. 895–905.
[39] J. S. Jensen, O. Sigmund, L. H. Frandsen, P. I. Borel, A. Harpøth, and M. Kristensen. "Topology design and fabrication of an efficient double 90-degree photonic crystal waveguide bend". In: *IEEE Photonics Technology Letters* 41.2 (2005), pp. 69–71.

[38] J. S. Jensen and O. Sigmund. “Topology optimization of photonic crystal structures: A high-bandwidth low-loss T-junction waveguide”. In: *Journal of the Optical Society of America B: Optical Physics* 22.6 (2005), pp. 1191–1198.

[37] A. TÃłtu, M. Kristensen, L. H. Frandsen, A. Harpøth, P. I. Borel, J. S. Jensen, and O. Sigmund. “Broadband topology-optimized photonic crystal components for both TE and TM polarizations”. In: *Optics Express* 13, http://www.opticsexpress.org/abstract.cfm?URI=OPEX-13-21-8606 (2005), pp. 8606–8611.

[36] P. I. Borel, A. Harpøth, L. H. Frandsen, M. Kristensen, J. S. Jensen, P. Shi, and O. Sigmund. “Topology optimization and fabrication of photonic crystal structures”. In: *Optics Express* 12.9 (2004), pp. 1996–2001.

[35] T. E. Bruns and Sigmund. “Toward the topology design of mechanisms that exhibit snap-through behavior”. In: *Computer Methods in Applied Mechanics and Engineering* 193 (2004), pp. 3973–4000.

[34] A. Donoso and O. Sigmund. “Topology Optimization of Multiple Physics Problems Modelled by Poisson’s equation”. In: *Latin American Journal of Solids and Structures* 1.2 (2004), pp. 169–189.

[33] L. H. Frandsen, A. Harpøth, P. I. Borel, M. Kristensen, J. S. Jensen, and O. Sigmund. “Broadband photonic crystal waveguide 60^o bend obtained utilizing topology optimization”. In: *Optics Express* 12.24 (2004), pp. 5915–5921.

[32] J. S. Jensen and O. Sigmund. “Systematic Design of Photonic Crystal Structures using Topology Optimization: Low-loss Waveguide Bends”. In: *Applied Physics Letters* 84.12 (2004), pp. 2022–2024.

[31] A. Kawamoto, M. P. Bendsøe, and O. Sigmund. “Articulated Mechanism Design with a Degree of Freedom Constraint”. In: *International Journal for Numerical Methods in Engineering* 61.9 (2004), pp. 1520–1545.

[30] A. Kawamoto, M. P. Bendsøe, and Sigmund O. “Planar Articulated Mechanism Design by Graph Theoretical Enumeration”. In: *Structural and Multidisciplinary Optimization* 27.4 (2004), pp. 295–299.

[29] G. H. Yoon, Y. Y. Kim, M. P. Bendsøe, and O. Sigmund. “Hinge-Free Topology Optimization with Embedded Translation-Invariant Differentiable Wavelet Shinkage”. In: *Structural and Multidisciplinary Optimization* 27.3 (2004), pp. 139–150.

[28] O. Sigmund. “A 99 line topology optimization code written in MATLAB”. English. In: *Structural and Multidisciplinary Optimization* 21 (2001). MATLAB code available online at: www.topopt.dtu.dk, pp. 120–127.

[27] O. Sigmund. “Design of Multiphysics Actuators using Topology Optimization - Part I: One-Material Structures”. In: *Computer Methods in Applied Mechanics and Engineering* 190.49-50 (2001), pp. 6577–6604.

[26] O. Sigmund. “Design of Multiphysics Actuators using Topology Optimization - Part II: Two-Material Structures”. In: *Computer Methods in Applied Mechanics and Engineering* 190.49-50 (2001), pp. 6605–6627.

[25] D. Tcherniak and O. Sigmund. “A Web-based topology optimization program”. In: *Structural and Multidisciplinary Optimization* 22.3 (2001), pp. 179–87.

[24] T. E. Bruns, O. Sigmund, and D. A. Tortorelli. “Numerical methods for the topology optimization of structures that exhibit snap-through”. In: *International Journal for Numerical Methods in Engineering* 55 (10 2002), pp. 1215–1237.

[23] M. M. Neves, O. Sigmund, and M. P. Bendsøe. “Topology Optimization of Periodic Microstructures with a Penalization of Highly Localized Buckling Modes”. In: *International Journal for Numerical Methods in Engineering* 54.6 (2002), pp. 809–834.

[22] O. Sigmund and J. S. Jensen. “Systematic design of phononic band gap materials and structures by topology optimization”. In: *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 361 (2003), pp. 1001–1019.

[21] T. Buhl, C. B. W. Pedersen, and O. Sigmund. “Stiffness design of geometrically non-linear structures using topology optimization”. In: *Structural and Multidisciplinary Optimization* 19.2 (2000), pp. 93–104.

[20] L. V. Gibiansky and O. Sigmund. “Multiphase Elastic Composites with Extremal Bulk Modulus”. In: *Journal of the Mechanics and Physics of Solids* 48.3 (2000), pp. 461–498.

[19] O. Sigmund. “A new class of extremal composites”. In: *Journal of the Mechanics and Physics of Solids* 48.2 (2000), pp. 397–428.

[18] O. Sigmund. “Topology optimization: A tool for the tailoring of structures and materials”. In: *Philosophical Transactions - Mathematical Physical and Engineering Sciences* 358.1765 (2000), pp. 211–228.

[17] C. B. W. Pedersen, T. Buhl, and O. Sigmund. “Topology Synthesis of large-displacement compliant mechanisms”. In: *International Journal for Numerical Methods in Engineering* 50.12 (2001), pp. 2683–2705.

[16] M. P. Bendsøe and O. Sigmund. “Material Interpolation Schemes in Topology Optimization”. In: *Archives of Applied Mechanics* 69.9-10 (1999), pp. 635–654.

[15] J. Jonsmann, O. Sigmund, and S. Bouwstra. “Compliant Thermal Microactuators”. In: *Sensors and Actuators A: Physical* 76.1-3 (1999), pp. 463–469.

[14] O. Sigmund and S. Torquato. “Design of smart composite materials using topology optimization”. In: *Smart Materials and Structures* 8.3 (1999), pp. 365–379.

[13] J. Petersson and O. Sigmund. “Slope constrained topology optimization”. In: *International Journal for Numerical Methods in Engineering* 41.8 (1998), pp. 1417–1434.

[12] O. Sigmund and J. Petersson. "Numerical instabilities in topology optimization: A survey on procedures dealing with checkerboards, mesh-dependencies and local minima". In: *Structural Optimization* 16.1 (1998), pp. 68–75.
[11] O. Sigmund, S. Torquato, and I. A. Aksay. "On the Design of 1-3 Piezocomposites Using Topology Optimization". In: *Journal of Materials Research* 13.4 (1998), pp. 1038–1048.
[10] U. D. Larsen, O. Sigmund, and S. Bouwstra. "Design and Fabrication of Compliant Micromechanisms and Structures with Negative Poisson's Ratio". In: *IEEE Journal of Microelectromechanical Systems* 6.2 (1997), pp. 99–106.
[9] O. Sigmund. "On the design of compliant mechanisms using topology optimization". In: *Mechanics of Structures and Machines* 25.4 (1997), pp. 493–524.
[8] O. Sigmund and S. Torquato. "Design of Materials with Extreme Thermal Expansion using a Three-Phase Topology Optimization Method". In: *Journal of the Mechanics and Physics of Solids* 45.6 (1997), pp. 1037–1067.
[7] O. Sigmund and S. Torquato. "Composites with Extremal Thermal Expansion Coefficients". In: *Applied Physics Letters* 69.21 (1996), pp. 3203–3205.
[6] A. R. Díaz and O. Sigmund. "Checkerboard Patterns in Layout Optimization". In: *Structural Optimization* 10.1 (1995), pp. 40–45.
[5] O. Sigmund. "Tailoring materials with prescribed elastic properties". In: *Mechanics of Materials* 20 (1995), pp. 351–368.
[4] O. Sigmund. "Materials with prescribed constitutive parameters: an inverse homogenization problem". In: *International Journal of Solids and Structures* 31.17 (1994), pp. 2313–2329.
[3] O. Sigmund. "Tailoring materials for specific needs". In: *Journal of Intelligent Materials, Systems and Structures* 5 (1994), pp. 736–742.
[2] G. I. N. Rozvany, T. Lewiński, O. Sigmund, D. Gerdes, and T. Birker. "Optimal topology of trusses or perforated deep beams with rotational restraints at both ends". In: *Structural Optimization* 5 (1993), pp. 268–270.
[1] G. I. N. Rozvany, O. Sigmund, T. Lewiński, D. Gerdes, and T. Birker. "Exact optimal layouts for non-self-adjoint problems". In: *Structural Optimization* 5 (1993), pp. 204–206.

Patent Applications

[3] C. V. Poulsen, L. V. Hansen, O. Sigmund, J. E. Pedersen, and M. Beukema. *Optical fiber article comprises optical fiber for laser and package, which has carrier with surface for supporting supported part of optical fiber, in which the carrier surface remains convex during use of the article*. International Patent WO2006000543. 2006.
[2] O. Sigmund and A. H. Nielsen. *Birefringence optical fiber used as polarization maintaining optical fiber comprises outer cladding with radially oblong stress-redistributing regions having lower Young's modulus than material compositions of stress-producing segments*. International Patent Application WO2005083483-A1. Approved but not enforced for commercial reasons. 2005.
[1] O. Sigmund, M. Beukema, and J.E. Pedersen. *Temperature sensitivity controlling method for optical waveguide, involves using displacement amplifier which moves perpendicular to axis of waveguide*. International Patent Application WO200135133-A. Approved but not enforced for technical reasons. 2001.

Book Chapters

[4] M. P. Bendsøe and O. Sigmund. "Optimization of Structural and Mechanical Systems". English. In: *Optimization of Structural and Mechanical Systems*. Ed. by J. S. Arora. Singapore: World Scientific, 2007. Chap. 6, pp. 161–194. ISBN: 978-981-256-962-2.
[3] O. Sigmund and M. P. Bendsøe. "Topology Optimization – From airplanes to nanooptics". In: *Bridging from technology to society*. Ed. by K. Stubkjær and T. Kortenbach. Lyngby, Denmark: Technical University of Denmark, 2004. Chap. 3, pp. 40–51.
[2] O. Sigmund. "Synthesis of periodic micro mechanisms: Extremal material design by topology optimization". In: *Optimal synthesis methods for MEMS*. Ed. by G. K. Ananthasuresh. MEMS-series. Kluwer Academic Publishers, 2003. Chap. 7.
[1] G. I. N. Rozvany, M. Zhou, and O. Sigmund. "Topology Optimization in Structural Design". In: *Advances in Design Optimization*. Ed. by H. Adeli. London: Chapman and Hall, 1994. Chap. 10, pp. 340–399.

Papers in Proceedings

[92] B.M.D.A Jokisch, O. Sigmund, and R.E. Christiansen. "Inverse design of dielectric nanostructures for optical trapping". In: *Optical Trapping and Optical Micromanipulation XXI*. Ed. by Kishan Dholakia, Halina Rubinsztein-Dunlop, and Giovanni Volpe. Vol. 13112. International Society for Optics and Photonics. SPIE, 2024, p. 1311204.

[91] J. Alexandersen and O. Sigmund. “Revisiting the optimal shape of cooling fins: A one-dimensional analytical study using optimality criteria”. In: *Proceedings of the Twentieth InterSociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm 2021)*. 2021, pp. 24–30. eprint: arXiv:2012.04310.

[90] M.J. Baandrup, N. Aage, and O. Sigmund. “Structural topology optimization of bridge girders in cable supported bridges”. In: *IABSE Conference âĂŞ Engineering the Developing World*. 25-04-2018 Through 27-04-2018. 2018.

[89] D.D. Gerrard, Y. Chen, S.A. Chandorkar, G. Yu, J. Rodriguez, I.B. Flader, D.D. Shin, C.D. Meinhart, O. Sigmund, and T.W. Kenny. “Topology optimization for reduction of thermo-elastic dissipation in MEMS resonators”. In: *2017 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS)*. 2017, pp. 794–797.

[88] D. Ruiz, A. DÃ■az-Molina, O. Sigmund, J. C. Bellido, A. Donoso, and J. L. SÃąnchez-Rojas. *Optimal design of a microgripper-type actuator based on AlN/Si heterogeneous bimorph*. 2017.

[87] L.H. Frandsen, Y. Elesin, X. Guan, O. Sigmund, and K. Yvind. “Flat-top Drop Filter based on a Single Topology Optimized Photonic Crystal Cavity”. In: *CLEO: Science and Innovations*. Optical Society of America. 2015, SF2H–7.

[86] L.F. Frellsen, L.H. Frandsen, Y. Ding, Y. Elesin, O. Sigmund, and K. Yvind. “Topology-optimized silicon photonic wire mode (de) multiplexer”. In: *SPIE OPTO*. International Society for Optics and Photonics. 2015, pp. 93670X–93670X.

[85] J. Andkjaer, C.P. Ryder, P.C. Nielsen, T. Rasmussen, K. Buchwald, and O. Sigmund. “Topology-optimized broadband surface relief transmission grating”. In: *PHYSICS AND SIMULATION OF OPTOELECTRONIC DEVICES XXII*. Ed. by Witzigmann, B and Osinski, M and Henneberger, F and Arakawa, Y. Vol. 8980. Proceedings of SPIE. Conference on Physics and Simulation of Optoelectronic Devices XXII, San Francisco, CA, FEB 03-06, 2014. SPIE. 2014. ISBN: 978-0-8194-9893-9.

[84] M. Otomori, J. Andkjær, O. Sigmund, K. Izui, and S. Nishiwaki. “Topology Optimization for the Microstructure Design of Dielectric Materials”. In: *The Seventh China-Japan-Korea Joint Symposium on Optimization of Structural and Mechanical Systems*. 2012.

[83] *Modelling of Active Semiconductor Photonic Crystal Waveguides and Robust Designs based on Topology Optimization*. Stockholm, Sweden: IEEE, 2011. URL: http://www.ict.kth.se/MAP/FMI/Negonet/icton2011/.

[82] M. Pu, L. Yang, L.H. Frandsen, J.S. Jensen, O. Sigmund, H Ou, K. Yvind, and J. M. Hvam. “Topology-optimized slow-light couplers for ring-shaped photonic crystal waveguide”. In: *2010 Conference on (OFC/NFOEC) Optical Fiber Communication (OFC), collocated National Fiber Optic Engineers Conference, 1-3*. 2010.

[81] F. Wang, J.S. Jensen, and O. Sigmund. “Systematic and robust design of photonic crystal waveguides by topology optimization”. In: *A I P Conference Proceedings Series*. Vol. 1291. International Workshop on Theoretical and Computational Nano-Photonics. 2010, pp. 155–157.

[80] C. S. Andreasen and O. Sigmund. “Optimization of the pressure coupling coefficient in periodic poroelastic materials”. In: *European Conference on Computational Mechanics (ECCM 2010*. 2010, p. 757.

[79] O. Sigmund. “Systematic design of metamaterials by topology optimization”. In: *Symposium on Modelling Nanomaterials and Nanosystems*. Ed. by R. Pyrz and J. C. Rauhe. Vol. 13. IUTAM Bookseries. IUTAM. Springer, 2009, pp. 151–160.

[78] B. Lazarov and O. Sigmund. “Sensitivity filters in topology optimisation as a solution to Helmholtz type differential equation”. In: *World Congress on Structural and Multidisciplinary Optimization, Lisbon*. Ed. by H. Rodriques. ISSMO. 2009.

[77] O. Sigmund. “PDE-interpolations in topology optimization”. In: *Proceedings of the Twenty Second Nordic Seminar on Computaional Mechanics*. Ed. by L. et al. Damkilde. DCE technical Memorandum 11. NSCM. Aalborg University, 2009, pp. 1–8.

[76] N. Aage, A. Mortensen, and O. Sigmund. “Topology optimization of devices for wireless energy transfer : The design parametrization”. In: *8th World Congress on Structural and Multidisciplinary Optimization*. 2009.

[75] N. Aage and O. Sigmund. “Topology Optimization of Metallic Microwave Devices”. In: *Advances in Topology and Material Optimization : Methods and Industrial Applications*. 2009.

[74] A. Erentok and O. Sigmund. “Three-dimensional Topology Optimized Electrically-Small Conformal Antenna”. In: *IEEE antennas and propagation society international symposium*. Vol. 1-9. IEEE, 2008, pp. 1120–1123.

[73] O. Sardan, K.N. Andersen, A.N. MacDonald, O. Sigmund, P. Bøggild, and A. Horsewell. “Focused ion beam (fib) modification of topology optimized polysilicon microgrippers”. In: *ASME 2008 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*. American Society of Mechanical Engineers. 2008, pp. 629–631.

[72] Ö. Sardan, V. Eichhorn, D.H. Petersen, S. Fatikow, O. Sigmund, and P. Bøggild. “Topology optimized Microgrippers for Nanomanipulation of Carbon Nanotubes”. In: *Proceeding of IDETC/CIE*. 2008.

[71] R. Matzen, J.S. Jensen, and O. Sigmund. “Transient Topology Optimization of Two-Dimensional Elastic Wave Propagation”. In: *Proceedings of the 9. International Conference on Computational Structures Technology*. Ed. by BHV Topping and M Papadrakakis. Athens, Greece, 2008.

[70] L. Yang, A. Lavrinenko, O. Sigmund, and J. M. Hvam. "1D Grating structures designed by the time domain topology optimization". In: *17th International workshop on optical waveguide theory and numerical modelling : OWTNM 2008*. 2008.

[69] A. R. Gersborg and O. Sigmund. "MAXIMIZING OPTO-ELASTIC INTERACTION". In: *21 Nordic Seminar on Computational Mechanics : NSCM-21. Trondheim, Noway 16th-17th October 2008*. 2008.

[68] M. Poel, M. Beck, M. B. Dühring, M. M. de Lima, L. H. Frandsen, C. Peucheret, O. Sigmund, U. Jahn, J. M. Hvam, and P. Santos. "Surface acoustic wave driven light modulation". English. In: *Proceedings ECIO*. DTU, Kgs. Lyngby, Denmark: COM.DTU, 2007.

[67] M. B. Dühring, O. Sigmund, and J. S. Jensen. "Simulation of acousto-optical interaction in a Mach-Zehnder interferometer". In: *Proceedings ECIO*. Presented at: XVI International Workshop on Optical Waveguide Theory and Numerical Modelling, OWTNM ; 16 : Copenhagen, Denmark, 2007. DTU, Kgs. Lyngby, Denmark: COM.DTU, 2007.

[66] L. H. Frandsen, A. Lavrinenko, P. I. Borel, J. Fage-Pedersen, A. Harpoth, O. Sigmund, J. S. Jensen, M. Kristensen, A. Tetu, and T. Niemi. "Topology-optimized and dispersion-tailored photonic crystal slow-light devices". In: *Passive components and fiber-based devices iv, pts 1 and 2*. Ed. by MJ Li, J Chem, S Kawanishi, and IH White. Vol. 6781. Proceedings Of The Society Of Photo-Optical Instrumentation Engineers (Spie). 2007, P7812.

[65] K. G. Hougaard and O. Sigmund. "Maximizing the Optical Band Gap in 2D Photonic Crystals". Presented at: XVI International Workshop on Optical Waveguide Theory and Numerical Modelling, OWTNM ; 16 : Copenhagen, Denmark, 2007. DTU, Kgs. Lyngby, Denmark, 2007.

[64] Ö. Sardan, P. Bøggild, O. Sigmund, and K. Mølhave. "Topology optimised Electrothermal Polysilicon Microgrippers". In: *Proceedings of MNE-33rd International Conference on Micro and Nano Engineering*. Copenhagen, Denmark, 2007, pp. 165–166.

[63] O. Sigmund. "On Topology Optimization with Manufacturing Constraints". In: *III European Conference on Computational Mechanics*. Ed. by C. A. Mota Soares. Lisbon, 2006.

[62] J. S. Jensen and O. Sigmund. "Topology optimization of wave-propagation problems". English. In: *IUTAM Symposium on Topological Design Optimization of Structures, Machines and Materials: Status and Perspectives*. Solid Mechanics and its Applications; 137. Rungstedgaard, Copenhagen, Denmark: Springer, 2006, pp. 387–390. ISBN: 1-4020-4729-0.

[61] Y. Sugimoto et al. "Topology Optimization for Photonic Crystal Waveguide Intersection with Wide and Flat Bandwidths in Ultra-Fast All-Optical Switch (PC-SMZ)". English. In: *Proceedings European Conference on Optical Communication*. Presented at: European Conference on Optical Communication, ECOC : Cannes, France, 2006. Cannes, France, 2006.

[60] P. I. Borel, L. H. Frandsen, A. Lavrinenko, B. B. Olsen, T. Nielsen, A. Kristensen, J. S. Jensen, and O. Sigmund. "Optical characterisation of photonic wire and photonic crystal waveguides fabricated using nanoimprint lithography". English. In: *Proceedings European Conference on Optical Communication ; CD-ROM*. Presented at: ECOC : Cannes, France, 2006. Cannes, France: ECOC, 2006.

[59] L. H. Frandsen, P. I. Borel, J. S. Jensen, and Ole Sigmund. "Topology Optimized Photonic Wire Splitters". English. In: *CLEO/QELS 2006 Technical Digest CD-Rom*. Presented at: Conference on Lasers and Electro-Optics, CLEO : Long Beach, CA, USA, 2006. Long Beach, CA, USA, 2006. ISBN: 15-57-52813-6.

[58] P. M. Clausen and O. Sigmund. "The pressure load problem re-visited". In: *Topological design optimization of structures, machines and materials – status and perspectives*. Ed. by M. P. Bendsøe, N. Olhoff, and O. Sigmund. 2005.

[57] G. H. Yoon, J. S. Jensen, and O. Sigmund. "Topology Optimization for Acoustic Structure Interaction Problems". In: *Topological design optimization of structures, machines and materials – status and perspectives*. Ed. by M. P. Bendsøe, N. Olhoff, and O. Sigmund. Solid Mechanics and its applications. Springer, 2005.

[56] J. S. Jensen and O. Sigmund. "Systematic design of acoustic devices by topology optimization". English. In: *ICSV12 Proceedings, Twelfth International Congress on Sound and Vibration. Lisbon, Portugal*. Ed. by J. L. Coelho and D. Alarcão. CD-ROM. Lisbon, Portugal, 2005, p. 8.

[55] P. I. Borel, L. H. Frandsen, A. Harpøth, M. Kristensen, P. Xing T. Niemi, J. S. Jensen, and O. Sigmund. "Design and fabrication of SOI-based photonic crystal components". In: *ICTON/ESPC Conference*. ICTON/ESPC. Wroslaw, Poland, 2004, p. xx.

[54] A. Harpøth, L. H. Frandsen, M. Kristensen, P. I. Borel, J. S. Jensen, O. Sigmund, and P. Shi. "Fabrication of topology optimized photonic crystal waveguide Z-bend displaying large bandwidth with very low bend loss". In: *International Symposium on Photonic and Electromagnetic Crystal Structures V (PECS-V)*. 2004.

[53] J. S. Jensen and O. Sigmund. "Topology optimization: A systematic method to improve the performance of photonic crystal structures". In: *International Symposium on Photonic and Electromagnetic Crystal Structures V (PECS-V)*. Mar. 2004.

[52] O. Sigmund, J. S. Jensen, A. Gersborg-Hansen, and R. B. Haber. "Topology Optimization in Wave-propagation and Flow Problems". In: *Optimal Shape Design and Modeling*. Ed. by T. Lewiński, O. Sigmund, J. Sokolowski, and A. Zochowski. Systems Research Institute, Polish Academy of Sciences. Warszawa: Akademicka Oficyna Wydawnicza, 2004, pp. 45–54.

[51] M. P. Bendsøe, J. M. Guedes, M. M. Neves, H. C. Rodrigues, and O. Sigmund. "Aspects of the design of microstructures by computational means". In: *In Homogenization 2001. Proceedings of the First HMS2000 International School and Conference on Homogenization, Naples, June 18-22 and 23-27, 2001*. Ed. by L. Carbone and R. De Arcangelis. Vol. 18. Gakkotosho, Tokyo: GAKUTO Int. Series in Math. Sci, Appl., 2003, pp. 99–112.

[50] J. S. Jensen and O. Sigmund. "Topology optimization of two-dimensional waveguides". In: *Proc. 5th World Congress of Structural and Multidisciplinary Optimization, May 19-23, 2003, Lido de Jesolo, Italy*. Ed. by C. Cinquini, M. Rovatai, P. Venini, and R. Nascimbene. Italian Polytechnic Press, Milano. Italian Polytechnic Press, Milano, 2003, pp. 125–126.

[49] A. Kawamoto, M. P. Bendsøe, and O. Sigmund. "Articulated Mechanism Design with Introduction of DOF Constraints". In: *Proc. 5th World Congress of Structural and Multidisciplinary Optimization, May 19-23, 2003, Lido de Jesolo, Italy*. Ed. by C. Cinquini, M. Rovatai, P. Venini, and R. Nascimbene. Italian Polytechnic Press, Milano. Italian Polytechnic Press, Milano, 2003, pp. 131–132.

[48] O. Sigmund, A. Gersborg-Hansen, and R. B. Haber. "Topology Optimization for Multiphysics Problems: A Future FEMLAB Application". In: *Nordic Matlab Conference*. Ed. by L. Gregersen. Comsol, Søborg, Denmark. 2003, pp. 237–242.

[47] O. Sigmund and J. S. Jensen. "Design of Acoustic Devices by Topology Optimization". In: *Proc. 5th World Congress of Structural and Multidisciplinary Optimization, May 19-23, 2003, Lido de Jesolo, Italy*. Ed. by C. Cinquini, M. Rovatai, P. Venini, and R. Nascimbene. Italian Polytechnic Press, Milano. Italian Polytechnic Press, Milano, 2003, pp. 267–268.

[46] J. S. Jensen and O. Sigmund. "Phononic bandgap structures as optimal designs". In: *IUTAM Symposium on Asymptotics, Singularities and Homogenization in Problems of Mechanics, Liverpool, UK, 8-11 July, 2002*. Ed. by A. B. Movchan. IUTAM. Kluwer Academic Publishers, 2003, pp. 71–81.

[45] O. Sigmund. "Microstructural Design of Elastic Band Gap Structures". In: *WCSMO-4 - Proc. Second World Congress of Structural and Multidisciplinary Optimization*. Ed. by G. D. Cheng, Y. Gu, S. Liu, and Y. Wang. CD-rom, ISBN 7-900312-69-2. Dalian: Liaoning Electronic Press, 2001.

[44] M. P. Bendsøe and O. Sigmund. "Material models in topology optimization". In: *Lecture notes, Advanced School and Workshop on Bone Mechanics - Mathematical and Mechanical Models for Analysis and Synthesis*. Instituto Superior Tecnico, Lisbon, Portugal, June 24-28. 2002, p. 30.

[43] M. M. Neves, O. Sigmund, and M. P. Bendsøe. "Topology Optimization of Periodic Microstructures with a Buckling Criteria". In: *Proceedings of the Fifth World Congress on Computational Mechanics*. Ed. by H. A. Mang, F. G. Rammerstorfer, and J. Eberhardsteiner. Vienna University of Technology, Austria. 2002, http://wccm.tuwien.ac.at.

[42] O. Sigmund. "Material Design by Topology Optimization". In: *Plasticity, Damage and Fracture at Macro, Micro and Nano Scales, Proceedings of Plasticity '02, Aruba January 2002*. Ed. by A. S. Kahn and O. Lopez-Pamies. IUTAM. Neat Press, Maryland, USA, 2002, pp. 45–47.

[41] O. Sigmund and J. S. Jensen. "Topology Optimization of Elastic Band Gap Structures and Waveguides". In: *Proceedings of the Fifth World Congress on Computational Mechanics*. Ed. by H. A. Mang, F. G. Rammerstorfer, and J. Eberhardsteiner. Vienna University of Technology, Austria. 2002, http://wccm.tuwien.ac.at.

[40] J. S. Jensen and O. Sigmund. "Phononic band gap structures as optimal designs". In: *Proc. IUTAM symp. on asymptotics, singularities, and homogenization in problems of mechanics*. Ed. by A. B. Movchan. IUTAM. IUTAM, Liverpool, July, 2002, 2003.

[39] J. S. Jensen, O. Sigmund, J. J. Thomsen, and M. P. Bendsøe. "Design of Multi-phase Structures with Optimized Vibrational and Wave-transmitting Properties". In: *Proceedings of the 15th Nordic seminar on Computational Mechanics, October 18-19, 2002*. Ed. by E. Lund, N. Olhoff, and J. Stegmann. NSCM 15. Institute of Mechanical Engineering, Aalborg University, Denmark, 2002, pp. 63–66.

[38] M. M. Neves, O. Sigmund, and M. P. Bendsøe. "A Buckling Performance Index for Topology Design of Periodic Microstructures". In: *Proceedings of the ECCOMAS 2000*. Barcelona, Spain, Sept. 2000.

[37] O. Sigmund. "Systematic Design of Micro and Macro Systems". In: *Symposium on Deployable Structures: Theory and Applications, Cambridge, UK, 1998*. Ed. by S. Pellegrino. IUTAM. 2000, pp. 373–382.

[36] O. Sigmund. "Systematic Design of Mechanical Systems usign Topology Optimization". In: *Proceedings of the 2nd ASMO/ISSMO Conference on Engineering Design Optimixzation*. ASMO/ISSMO. Swansea, UK, 2000, pp. 5–13.

[35] O. Sigmund, T. Buhl, and C. B. W. Pedersen. "On the influence of geometrical non-linearities in topology optimization". In: *Topology Optimization of Structures and Composite Continua*. Ed. by G. I. N. Rozvany and N. Olhoff. NATO Science Series, 2000, pp. 61–74.

[34] T. E. Bruns and O. Sigmund. "Topology design of bistable mechanisms". In: *WCSMO-4 - Proc. Second World Congress of Structural and Multidisciplinary Optimization*. Ed. by G. D. Cheng, Y. Gu, S. Liu, and Y. Wang. CD-rom, ISBN 7-900312-69-2. Dalian: Liaoning Electronic Press, 2001.

[33] J. Lieneman, A. Greiner, J. G. Korvink, and O. Sigmund. "Optimization of Integrated Magnetic Field Sensors". In: *MSM2001*. 2001.

[32] O. Sigmund. "Recent developments in extremal material design". In: *Trend in computational Mechanics*. Ed. by W. A. Wall, K.-U. Bletzinger, and K. Schweizerhof. CIMNE. 2001, pp. 228–232.

[31] O. Sigmund. "Topology Optimization of Multi-Physics, Multi-Material Structures". In: *3rd WCSMO, Niagara Falls*. Winner of the ISSMO/Springer award 2000. May 1999.
[30] O. Sigmund. "Topology Synthesis of Two-Phase Compliant Actuators". In: *1999 ASME Design Engineering Technical Conference, Las Vegas*. DETC99/DAC-8553. Sept. 1999.
[29] O. Sigmund. "A new class of extremal composites inspired by topology optimization". In: *Proceedings of European Conference on Computaional Mechanics*. ECCM '99. 1999, CD–rom.
[28] M. P. Bendsøe, M. M. Neves, and O. Sigmund. "Some recent results on topology optimization 0of periodic composites". In: *Topology Optimization of Structures and Composite Continua*. Ed. by G. I. N. Rozvany and N. Olhoff. NATO Science Series, 2000, pp. 3–17.
[27] M. P. Bendsøe and O. Sigmund. "Grey-Scales in Topology Optimization: Hashin-Strikhman and Realization by Composite". In: *Abstract Book of ICTAM 2000*. IUTAM. Chicago, 2000.
[26] T. Buhl, C. B. W. Pedersen, and O. Sigmund. "Designing Geometrically Non-Linear Structures using Topology Optimization". In: *3rd WCSMO, Niagara Falls*. May 2000.
[25] O. Sigmund and S. Torquato. "Design of Materials with extreme elastic and thermoelastic propeties using topology optimization". In: *IUTAM Symposium on Transformation Problems in Composite and Active Materials*. Ed. by Y. A. Bahei El Din and G. J. Dvorak. IUTAM. Kluwer Academic Publishers, 1998, pp. 233–246.
[24] O. Sigmund, S. Torquato, L. V. Gibiansky, and I. A. Aksay. "On the design of hydrophones made as 1–3 piezoelectrics". In: *IUTAM Symposium on Transformation Problems in Composite and Active Materials*. Ed. by Y. A. Bahei El Din and G. J. Dvorak. IUTAM. Kluwer Academic Publishers, 1998, pp. 147–159.
[23] J. Jonsmann, O. Sigmund, and S. Bouwstra. "Compliant Electro-Thermal Microactuators". In: *MEMS'99*. 1999, pp. 588–593.
[22] J. Jonsmann, O. Sigmund, and S. Bouwstra. "Multi Degrees of Freedom Electro-Thermal Microactuators". In: *TRANSDUCERS'99*. 1999, pp. 1372–1375.
[21] C. B. W. Pedersen, T. Buhl, and O. Sigmund. "Topology Synthesis of Large-Displacement Compliant Mechanisms". In: *1999 ASME Design Engineering Technical Conference, Las Vegas*. DETC99/DAC-8554. Sept. 1999.
[20] O. Sigmund. "On the Optimality of Bone Microstructure". In: *Synthesis in Bio Solid Mechanics*. Ed. by P. Pedersen and M. P. Bendsøe. IUTAM. Kluwer, 1999, pp. 221–234.
[19] O. Sigmund. "Design and manufacturing of material microstructures and micromechanisms". In: *Proceedings of the third international conference on intelligent material, ICIM96, Lyon, June*. Ed. by P. Gobin. Invited paper. SPIE vol. 2779, 1996, pp. 856–866.
[18] O. Sigmund. "Design of thermomechanical actuators using topology optimization". In: *Second World Congress on Structural and Multidiciplinary Optimization, Zakopane, Poland, May*. Ed. by W. Gutkowski and Z. Mróz. IFTR, 1997, pp. 393–398.
[17] O. Sigmund and S. Torquato. "Design of Materials with Extreme Thermal Expansion using a Three-Phase Topology Optimization Method". In: *Smart Materials Technology, March, 1997, San Diego, California*. SPIE. 1997.
[16] P. Duysinx and O. Sigmund. "New Developments in Handling Stress Constraints in Optimal Material Distributions". In: *7th Symposium on Multidiciplinary Analysis and Optimization*. AIAA/USAF/NASA/ISSMO. AIAA-98-4906, Sept. 1998, pp. 1501–1509.
[15] O. Sigmund. "Systematic Design and Optimization of Multi-Material, Multi-Degree-of-Freedom Micro Actuators". In: *Modelling and Simulation of Microsystems, Semiconductors, Sensors and Actuators*. MSM2000. Santa Diego, California, 1998, pp. 36–39.
[14] O. Sigmund. "Systematic design of micro actuators using topology optimization". In: *SPIE's 5th Ann. Int. Symp. on Smart Structures and Materials, Smart Electronics and MEMS*. Ed. by V. K. Varadan, P. J. McWhorter, R. A. Singer, and M. J. Vellekoop. SPIE, Volume 3328. San Diego, California, Mar. 1998, pp. 23–31.
[13] O. Sigmund. "Systematic Design of Electrothermomechanical Microactuators using Topology Optimization". In: *Modelling and Simulation of Microsystems, Semiconductors, Sensors and Actuators*. MSM98. Santa Clara, California, 1998, pp. 350–355.
[12] O. Sigmund. "Topology Optimization in Multiphysics Problems". In: *7th Symposium on Multidiciplinary Analysis and Optimization*. AIAA/USAF/NASA/ISSMO. AIAA-98-4905, Sept. 1998, pp. 1492–1500.
[11] G. I. N. Rozvany, M. Zhou, T. Lewiński, and O. Sigmund. "Iterative discretized methods for layout optimization and generalized shape optimization". In: *Structural Optimization 1993, Rio de Jaineiro, Brazil*. Ed. by J. Herskovits. 1993, pp. 37–46.
[10] G. I. N. Rozvany, M. Zhou, T. Lewiński, and O. Sigmund. "Optimal Layout Theory: New Classes of Exact Solutions for Trusses Including Several Load Conditions and Non-Self-Adjoint Problems". In: *Structural Optimization 1993, The World Congress on Optimal Design of Structural Systems. Proceedings VOL. X*. Ed. by J. Herskovits. Mech. Engng. Program, COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, Brazil., 1993, pp. 37–46.
[9] O. Sigmund, M. Zhou, and G. I. N. Rozvany. "Layout Optimization of large FE systems by new optimality criteria methods: Applications to beam systems". In: *Concurrent engineering tools and technologies for mechanical systems design*. Ed. by E. J. Haug. New York: Springer, 1993, pp. 803–819.

[8] O. Sigmund. "Design of material structures using topology optimization". In: *First World Congress on Structural and Multidiciplinary Optimization, Goslar, Germany, May 28 - June 2*. Ed. by G. I. N. Rozvany and N. Olhoff. Oxford: Pergamon, 1995.
[7] U. D. Larsen, O. Sigmund, and S. Bouwstra. "Design and fabrication of compliant mechanisms and material structures with negative Poisson's ratio". In: *IEEE, International Workshop on Micro Electro Mechanical Systems, MEMS-96*. 1996.
[6] O. Sigmund. "Some inverse problems in topology design of materials and mechanisms". In: *Symposium on optimization of mechanical systems*. Ed. by D. Bestle and W. Schielen. IUTAM. Netherlands: Kluwer, 1996, pp. 277–284.
[5] G. I. N. Rozvany, O. Sigmund, and T. Birker. "Optimal design of composite and finre-reinforced plates". In: *Optimization with Advanced Materials*. Ed. by P. Pedersen. Amsterdam: Elsevier, 1993, pp. 293–309.
[4] G. I. N. Rozvany, O. Sigmund, M. Zhou, and T. Birker. "Iterative discretized methods for layout optimization and generalized shape optimization". In: *Structural Optimization 1993, Rio de Jaineiro, Brazil*. Ed. by J. Herskovits. 1993, pp. 139–151.
[3] G. I. N. Rozvany, O. Sigmund, and T. Birker. "Optimal Design of Composite and Fibre-reinforced Plates". In: *Optimal Design with Advanced Materials*. Ed. by P. Pedersen. Elsevier, 1993, pp. 293–309.
[2] G. I. N. Rozvany, O. Sigmund, M. Zhou, and T. Birker. "Iterative Discretized Methods for Layout Optimization and Generalized Shape Optimization." In: *Structural Optimization 1993, The World Congress on Optimal Design of Structural Systems. Proceedings VOL. X*. Ed. by J. Herskovits. Mech. Engng. Program, COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, Brazil., 1993, pp. 139–151.
[1] G. I. N. Rozvany, M. Zhou, T. Birker, and O. Sigmund. "Topology optimization using iterative continuum-type optimality criteria (OC) methods for discretized systems". In: *Topology optimization of structures*. Ed. by M. P. Bendsøe and C. A. Mota Soares. Dordrecht: Kluwer, 1993, pp. 273–286.

Miscellaneous publications

[4] O. Sigmund. "PDE-interpolations in Topology Optimization". In: *IACM Expressions*. Vol. 23. International Association for Computational Mechanics, 2008, pp. 16–20. URL: `http://www.cimne.upc.es/iacm/News/Expressions23.pdf`.
[3] O. Sigmund. *Hvor skal hullerne være og hvilken facon skal de have*. Web-article appeared January 2001 on Orbitalen, the Danish Radio (DR) natural science web-page: http://www.dr.dk/videnskab/artikler/dtu/topolog.asp. (In Danish). 2001.
[2] O. Sigmund. *Notes and Exercises for the Course: FEM-Heavy (41525), fall semester*. Tech. rep. Department of Mechanical Engineering, DTU, 2001–2010.
[1] O. Sigmund. *Exercises with "A 99-line topology optimization code written in Matlab"*. Tech. rep. Department of Solid Mechanics, Technical University of Denmark, 2000.

Invited talks at conferences

[47] Invited talk, CMCS conference in Eindhoven, Netherlands, October 2023.
[46] Plenary talk, EUSPEN conference on Precision Engineering, Copenhagen, August 2023
[45] Plenary talk, Korean National Congress of Mechanical Engineering, South Korea, April, 2023
[44] Invited Talk, Gordon Research Conference (GRC) August 2022, *Additive Manufacturing of Soft Materials*, Ventura, California.
[43] KTH KEYNOTE seminar, November 12, 2020. `play.kth.se/media/Ole_Sigmund_talk/0_mffsjo3h`
[42] EML Webinar, June 17, 2020. See recording at YouTube `www.youtube.com/watch?v=aPzGEgFDfqk`.
[41] Keynote Speaker and Panelist, Workshop on Exploiting Advanced Manufacturing Capabilities: Topology Optimization in Design, National Academy of Sciences, Washington, November 2019.
[40] Invited Speaker, ECCOMAS Thematic Conference on Computational Modeling of Complex Materials across the Scales (CMCS 2019), Glasgow, October 2019.
[39] Invited Talk, 2nd ECCOMAS Thematic Conference on Simulation for Additive Manufacturing (Sim-AM), Padua, Italy, September, 2019.
[38] Invited Speaker, META 2019, Lisbon, Portugal, August 2019.
[37] Keynote Speaker at the Symposium for Computational Fabrication, Simulia World Conference, Boston, June 2018.
[36] Invited Speaker, IUTAM Symposium on Acoustic/elastic metamaterials, their design and applications, Beijing, June 2018.
[35] Plenary Talk, International Congress Engineering of Advanced Materials ICEAM2017, October 2017.
[34] Plenary Talk, 1st ECCOMAS Thematic Conference on Simulation for Additive Manufacturing (Sim-AM), October, 2017.
[33] Plenary Speaker 4M/IWMF2016 Conference, Lyngby, Denmark, September 2016.
[32] Plenary Lecturer ECCOMAS Congress, Crete, Greece, June 2016. 2500 Participants.
[31] Invited speaker, ICTAM, MS on Topology Optimization, Montreal, August, 2016.

[30] Invited speaker, IUTAM Symposium on Filling gaps in material property space, Cambridge, UK, March, 2016.
[29] Plenary Lecturer COUPLED PROBLEMS 2015, Venice, June, 2015 (see presentation at `www.youtube.com/watch?v=HH9RBQVzSZg&list=PLiyl-VE6-1ovBrjsfeNCvGmuQig21DdZ2&index=4`).
[28] Invited speaker, DCAMM 15th Symposium, Horsens, Denmark.
[27] Keynote speaker, Opt-I 2014, Kos, Greece, June.
[26] Eurogen 2013, Las Palmas de Gran Canaria, Spain, October (plenary speaker)
[25] ECCOMAS 2012, Vienna, Austria, September (semi-plenary speaker)
[24] NanoMeta 2011, Seefeldt, Austria, January (Invited speaker)
[23] Invited Participant, TalkShop Roundtable at Smart Geometry, Copenhagen 2011 (see interview at `www.youtube.com/watch?v=g8mJix3KmK4`)
[22] ECCM 2010, Paris, May (Semi Plenary Speaker)
[21] CJK-OSM 6, Kyoto, Japan, June 2010, (Keynote speaker)
[20] Netherlands MicroNano Conference '10, Twente, November (Keynote speaker)
[19] 9th World Congress on Structural and Multidisciplinary Optimization 2009, Lisbon, May (Panel speaker)
[18] Tacoma Photonics, Bad Honnef, 2009 (Invited Speaker)
[17] Photonics West 2007, San Jose, January (Invited speaker).
[16] Coupled Problems 2007, Ibiza, May (Plenary speaker).
[15] GAMM Annual Meeting 2006, Berlin, March (Plenary speaker).
[14] COMSOL User Conference 2006, Lyngby, November (Keynote speaker).
[13] Danish Physical Society, Annual Meeting 2004, Nyborg, Denmark (plenary after dinner speach).
[12] Congress for Computational Methods in Engineering, Lisbon, May-June, 2004 (keynote speaker).
[11] DTIP2003, Cote D'Azur, France, May, 2003 (plenary speaker).
[10] USNCCM, Albuquerque, New Mexico, August, 2003 (keynote lecturer).
[9] 6th Engineering Mechanics Symposium, Rolduc, Holland, November, 2003 (keynote speaker).
[8] Plasticity '02, Aruba, January, 2002.
[7] Workshop on Industrial Computational Mathematics, Uppsala December, 2001 (Keynote Speaker).
[6] 2nd ASMO/ISSMO Conference on Engineering Design Optimization, Swansea, UK, July, 2000 (keynote lecture).
[5] ICTAM 2000, Chicago August, 2000 (Sectional Lecturer).
[4] SPIE's 5th Annual International Symposium on Smart Structures and Materials, San Diego, USA, March, 1998
[3] Rencontre Mathematiques de Rouen, Homogeneisation, Solution Renormalisees et Solutions de Viscosite, Mont Saint Aignan, France, April, 1997.
[2] MMC/MIC, Joint Japan/Denmark Seminar on Micromachines, Lyngby, Denmark, June, 1997.
[1] 3rd International Conference on Intelligent Materials, Lyon, France, June 1996.

Talks at conferences (regular speaker)

+60 conference talks at international conferences.

Seminars

+70 seminars held at different institutions.

Ph.D. evaluation committees

[23] Chintankumar Jansari, U of Luxembourg, January 2024.
[22] Timo Gahlmann, Chalmers, November 2023.
[21] Stijn Koppen, TU Delft, Septemeber 2022.
[20] Bastian Telgen, ETH Zurich, July 2022.
[19] Zhijun Wang, University of Eindhoven, Netherlands, Fall 2020.
[18] Haojie Lian, University of Cardiff, UK, November 2014.
[17] Etienne Lemaire, University of Liege, Belgium, August 2013.
[16] Nico van Dijk, Delft University of Technology, Netherlands, November, 2012.
[15] Christian Frier Hvejsel, Aalborg University, Denmark, June, 2011.
[14] Michael Scherer, University of Erlangen-Nurenberg, Germany, January, 2011.
[13] Jukka I. Toivanen, University of Jyvaskyla, Finland, June 2010.
[12] Junji Kato, University of Stuttgart, Germany, November 2009.
[11] Vivien Challis, School of Mathematics and Physics, University of Queensland, Australia, May 2009.
[10] Ilkka Laitinen, Information Technology, Tampere University of Technology, Finland, May 2009.
[9] Niklas Wiker, Mekaniksystemer, Linkopings Universitet, Sweden , September 2008.

[8] Søren Dohn, Institut for Mikro og Nanoteknologi (MIC), DTU, Lyngby, March 2007.
[7] Roman Kemmler, University of Stuttgart, Germany, January 2004.
[6] Zachary Davis, Mikroelektronik Centret (MIC), DTU, Denmark, May 2003.
[5] Matthias Stolpe, Kungliga Tekniska Hogskolan (KTH), Sweeden, March 2003.
[4] Torben H. Lisby, Mikroelektronik Centret (MIC), DTU, Denmark, October 2002.
[3] Thomas Borrvall, Mekaniksystemer, Linkopings Universitet. Linkoping, Sweeden, June 2002.
[2] Jacob Thaysen, Mikroelektronik Centret (MIC), DTU, Denmark, September 2001.
[1] Jan Tue Ravnkilde, Mikroelektronik Centret (MIC), DTU, Denmark, April 2001.

Teaching experience

Lecturer and course responsible for 10 point graduate course "Finite Element (FEM) Heavy", Fall semesters 2001–, MEK, DTU.
Lecturer and shared course responsible for 5 point undergraduate course "Styrkelære 1", Spring semester 2016–, MEK, DTU.
Organizer and Lecturer in Ph.D.-course on Topology Optimization - Theory, methods and applications, June 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, 2021, MEK, DTU.
Lecturer and course responsible for 5 point undergraduate course "Dimensioning and Strength 1", Spring semester 2015, MEK, DTU.
Lecturer at CISM Summer school: "Computational Micromechanics of Material Science", Udine, Italy, June 2014.
Lecturer and partly course responsible for 10 point undergraduate course "Mechanics&Materials", Fall semesters 2003-2004, 2013, Dept. of Mechanical Engineering, DTU.
Lecturer and partly course responsible for 5 point undergraduate course "Dimensioning and Strength 1", Spring semester 2010, MEK, DTU.
Lecturer at NKT-Academy Fall School, Mols, Denmark, October 2004.
Lecturer at CISM Summer school: "Computational Micromechanics of Material Science", Udine, Italy, September 2002.
Co-Organizer and Lecturer in Ph.D.-course on Optimal Designs: Size, Shape and Topology, DCAMM, June 20-28, 2002, MEK, DTU.
Lecturer and course responsible for under-graduate course "Elasticity", Spring 2000-2001, Dept. of Solid Mechanics, DTU.
Three lectures during the Danish Science Festival (Dansk Naturvidenskabsfestival) at Danish high-schools, October, 2000.
Organizer and Lecturer in Ph.D.-course on Advanced Topics in Structural Optimization: Topology Optimization - Theory and Practice, June 22-30, 2000, Dept. of Solid Mechanics, DTU.
Lecturer at "Graduate Course: Structural Optimization and Reliability", Eindhoven University of Technology, Netherlands, November 1999.
Ph.D.-course on Advanced Topics in Structural Optimization. June 25-July 3. 1998, Dept. of Solid Mechanics, DTU.
Assistant lecturing and assistantship in undergraduate course "Elasticity" held at Dept. of Solid Mechanics, spring 1997 and 1998. Responsible for exams spring 1998.
Lecturer at "Summer school on mathematical methods of material science and engineering", Coimbra, Portugal, August 1997.
Lecturer at Ph.D.-course on Advanced Topics in Structural Optimization: Materials and Algorithms, Oct. 8-10, 1996 and Jan. 21-23. 1997, Dept. of Mathematics, DTU.
Teaching assistantships in courses: Strength of materials I and II, Thermodynamics, Fortran programming, CAD/CAM, 1986-1990, DTU.

PhD-students

(Statements in parentheses indicate present position and work place - when known)

[47] 2024-2027: Victor Pisinger, *Topology Optimization of Quantum-Opto-Mechanical Systems*
[46] 2023-2026: Philip Elbek, *Perturbation approaches and uncertainties in topology optimization*
[45] 2023-2026: Markus Tandrup Holm, *Maximizing energy absorption by inverse design*
[44] 2022–2025: Benat Martinex de Aguirre, *Inverse design of photonic devices for exploitation of transient and non-linear phenomena.*
[43] 2021–2024: Gøktug Isiklar, *Topology Optimization in Nano Photonics.*
[42] 2021–2024: Andreas Henrik Frederiksen, *Topology Optimization for Contact Problems.*
[41] 2021–2024: Rebekka Vaarum Woldseth, *Emerging methods for topology optimization.*
[39] 2021–2024: Peter Dørffler Ladegaard Jensen, *De-homogenization approaches for large scale topology optimization with non-linearities.*

[38] 2021–2024: Christoffer Fyllgraf Christensen, *Extremal microstructures for non-linear multi-scale topology optimization.*

[37] 2020–2023: (CA) Lukas Christian Høghøj, *Topology and Shape Optimization of Advanced Flow Problems..*

[36] 2020–2023: Erik Träff, *Efficient Solution Methods for Large Scale Topology Optimization Problems.*

[35] 2019–2022: (CA) Tim Felle Olsen, *Topology Optimization using Computer Graphics Techniques*

[34] 2018–2021: (CA) Gore Lukas Bluhm, *Non-linear material design.* (Postdoc at DTU)

[33] 2018–2021: Morten N. Andersen, *Material design for buckling.* (Modelling Specialist at Resolvent)

[32] 2018–2021: (CA) Florian Cyril Stutz, *TopOpt and Computer Graphics.* (Business Analyst at Baloise Group Actuarial)

[31] 2018–2021: (CA) Cian Conlan-Smith, *Aeroelastic shape optimization.* (Developer for Flight Physics Capabilities, Airbus, Germany)

[30] 2017–2021: (CA) Hansotto Kristiansen, *Reduced order methods.* (Numerical modelling and Simulation Specialist at Howden)

[29] 2017–2020: (CA) Mads Jacob Baandrup, *Long span bridge design*, MEK/BYG/COWI. (Structural Engineer/Specialist at COWI Bridges International)

[28] 2016–2018: Jeroen Groen, *Multiscale and projection-based TopOpt.* (Senior Engineer, Oqton Inc)

[27] 2015–2018: (CA) Joakim Vester Petersen, *Topopt for photovoltaics*, MEK/Aarhus University. (Asset Portfolio Lean in System Design at Vattenfall WInd Power)

[26] 2015–2018: Christian Lundgaard, *Topopt for TEGs (thermoelectric generators).* (Partner and CSO in Trebo)

[25] 2015–2018: (CA) Jan H.K. Haertel, *Topopt for heat exchange.* (Technology Expert at Covestro)

[24] 2014–2017: Sebastian Arlund Nørgaard, *TopOpt for thermofluidics.* (Software Developer at Canon Medical Informatics)

[23] 2013–2016: Anders Clausen, *TopOpt for additive manufacturing.* (Principal Engineer, Oqton Inc)

[22] 2013–2016: Rasmus Ellebæk Christiansen, *TopOpt for wave propagation problems.* (Associate Professor at Technical University of Denmark)

[21] 2012–2015: Joe Alexandersen, *Multiscale and thermofluidic TopOpt.* (Associate Professor at University of Southern Denmark)

[20] 2011–2014: Villads Egede Johansen, *Structural color generation.* MEK/Fotonik/B&O. (Optical Design Engineer at NIL Technology)

[19] 2012–2015: (CA) Morten Nobel-Jørgensen, *TopOpt on portable devices.* (Software Engineer at Apple)

[18] 2011–2014: (CA), Erik Andreassen, *TopOpt for damping materials.* (Principal Engineer, Oqton Inc)

[17] 2011–2014: (CA), Asger Nyman Christiansen, *TopOpt using deformable simplicial complexes*, MEK/Compute. (Senior Graphics Engineer, Cylindo)

[16] 2009–2013: Jacob Anders Andkjær, *Metamaterial Design*, MEK/EE/Fotonik. (Optical design engineer at Ibsen Photonics)

[15] 2009–2012: Fengwen Wang, *TopOpt of Photonic Crystals*, MEK/Fotonik. (Senior Researcher at Technical University of Denmark)

[14] 2008–2011: Niels Aage, *TopOpt of radio frequency and microwave structures.* (Associate Professor at Technical University of Denmark)

[13] 2008–2011: Rene Matzen, *Transient TopOpt in optoelasticity.* (Lead Data Scientist at ECCO Advanced Analytics)

[12] 2008–2011: Casper S. Andreasen, *Multiscale Optimization of Materials Subjected to Impact Loading.* (Associate Professor at Technical University of Denmark)

[11] 2007–2010: (CA) Oded Amir, *Reanalysis and TopOpt*, Mathematics/MEK. (Associate Professor at Technion - Israel Institute of Technology)

[10] 2006–2010: (CA) Lirong Yang, *TopOpt of Photonic Crystal Wave Guides*, Fotonik/MEK. (Principal Consultant, Decisioneers)

[9] 2006–2009: (CA) Özlem Sardan, *Micromechanical grippers*, Nanotech/MEK. (Technical Project Leader MEMS at Philips Innovation Services)

[8] 2006–2009: Maria Bayard Duhring, *TopoOpt for SAW devices.* (Structural Engineer, Rambøll, Department for Bridges)

[7] 2004–2006: Allan Gersborg-Hansen, *TopOpt of Fluid Flows*, MAT/MEK. (Formerly Senior Manager at LM Wind Power)

[6] 2002–2004: (CA) Atsushi Kawamoto, *Design of articulated mechanism by TopOpt*, MAT/MEK, DTU. (Program Manager, Toyota Central Research Development Laboratory Inc)

[5] 2001–2004: Lars Voxen Hansen, *Smart Packaging of Fibre Lasers*, MEK / KOHERAS A/S. (Partner, VL Dynamics)

[4] 1999–2002: Thomas Buhl, *Non-linear TopOpt in Combination with MEMS.* (Head of Center for Industrial Mechanics, Head of Mechatronics at Syddansk Universitet - University of Southern Denmark)

[3] 1999–2002: Claus B. W. Pedersen, *TopOpt of Non-Linear Structures*. (Technology Director at CTO Office R&D SIMULIA - Dassault Systemes)
[2] 1998–2001: (CA) Thomas A. Poulsen, *Multi-scale Representations in Optimal Design*.
[1] 1996–1999: (CA) Jacques Jonsmann, *Technology Development for Microactuators*, MIC/MEK. (Manager at Joninn ApS)

Postdocs

(Statements in parentheses indicate present position and work place - when known)

[31] 2024–: Christian Kern
[30] 2024–: Christoffer F. Christensen
[29] 2024–: Sukhminder Singh
[28] 2023–2024: Anna Dalklint
[23] 2022–: Federico Ferrari, *Buckling*.
[27] 2021–2023: Yafeng Wang, *Adaptive structures*
[26] 2021: Maria Brøns, *AM and TO*
[25] 2021–2023: Gore Lukas Bluhm, *TO with contact*
[24] 2018–2019: Nicolo Pollini, *Thermofluidics*. (Assistant Professor, Technion, Israel)
[23] 2018–2019: Federico Ferrari, *Buckling*. (Postdoctoral Researcher at Johns Hopkins University)
[22] 2018–2019: Yiqiang Wang, DTU Ørsted Postdoc, *Material design*. (Assistant Professor at Dalian University of Technology
[21] 2016–2020: Rasmus Ellebæk Christiansen, *Nano-optics*. (Associate Professor at Technical University of Denmark
[20] 2017: Jun Wu, DTU Ørsted Postdoc, *TopOpt for 3D print*. (Associate Professor at TU Delft)
[19] 2014–2015: Haojie Lian, *Shape optimization*. (Lecturer at Taiyuan University of Technology)
[18] 2013–2016: Mingdong Zhou, DTU Ørsted Postdoc, *Design for manufacturing tolerant structures*. (Associate Professor at Shanghai Jiao Tong University)
[17] 2013: Jacob Anders Andkjær, *Structural Colours*. (Optical design engineer at Ibsen Photonics)
[16] 2012–2014: Yuriy Elesin, *Nano-photonics*. (Senior Software Engineer at Haldor Topsøe A/S)
[15] 2011–2014: Niels Aage, *Large scale TopOpt*. (Associate Professor at Technical University of Denmark)
[14] 2011: Oded Amir, *Reanalysis methods*. (Associate Professor at Technion - Israel Institute of Technology)
[13] 2010–2011: Maria Bayard Düring, *Surface Engineering*. (Structural Engineer, Rambøll, Department for Bridges)
[12] 2007–2010: Allan Roulund Gersborg, *Optoelasticity*. (Formerly Senior Manager at LM Wind Power)
[11] 2007–2008: Aycan Erentok, *Antenna design and Meta-materials*. (Antenna Design @ Tesla)
[10] 2006: Roman Stainko, *Optoelasticity*. (RISC Software GmbH)
[9] 2005–2006: Jesper Riishede, *Optoelasticity*. (Team Leader - Pipe System Design, National Oilwell Varco)
[8] 2005–2007: Kristian G. Hougaard, *Photonic band gaps*. (Machine Learning Engineer at Dataanalyse i SKAT)
[7] 2004–2007: Gil-Ho Yoon, *Structural acoustics and electromechanics*. (Professor at Hanyang University)
[6] 2003–2005: Søren Halvkjær, *Phononic band gaps*. (Development Engineer at National Oilwell Varco Denmark)
[5] 2002: Claus B.W. Pedersen, *MEMS-design*. (Technology Director at CTO Office R&D SIMULIA - Dassault Systemes)
[4] 2002–2005: Jakob S. Jensen, *Phononic band gaps*. (Professor at Technical University of Denmark)
[3] 2000–2002: Tyler Bruns, *MEMS-design*. (Simulation, Optimization, and Analytics for Digital Twin Solutions, ANSYS Inc)
[2] 1998–1999: Dmitri Tcherniak, *MEMS-design*. (Research engineer at Bruel and Kjaer SVM)
[1] 1998–2002: Niels L. Pedersen, *MEMS-design*. (Associate Professor at Technical University of Denmark)

Senior Researchers

[3] 2018–2020: Anton Evgrafov.
[2] 2016–: Fengwen Wang.
[1] 2008–2017: Boyan Lazarov. (Research Staff Member at Lawrence Livermore National Laboratory)

M.Sc./B.Sc. Students (total of 84)

[2023] Ho Yuen Suen, Gustav Hofman Bang, Christian K. Jensen

[2022] Liisu Miller, Johannes Lindegaard Lildholdt, Niels Christian Henriksen

[2021] Peter Dørffler Ladegaard Jensen, Sebastian Vedsø Willems, Christian Vestergaard Sørensen, Martin Elingaard, Tanguy Navez

[2020] Lars Morten Sørensen (B.Sc.), Manuel Jimenez Abarca,

[2019] Christian Tyrrestrup and Thomas Alexander Vestergaard Sørensen, Hans Christian Christiansen, Keld Christensen, Søren Kjær Larsen, Lukas Christian Høghøj and Daniel Rugbjerg Nørhave, Erik Träff.

[2018] Peter Bager Beuschau, Andy Mattulat Filipovic (B.Sc.), Nicolas Kjær Højfeldt, Nicolai Obitsø Troldtoft Jensen, Erik Träff (B.Sc.)

[2017] Simon Dyring, Thomas Knudsen Lindberg and Lars Pallisgaard Hansen, Morten Jakobsen, Janus Asmussen, Daniel Gert Nielsen and Søren Damgaard Pedersen, Morten Nederlund, Christian Rye Thomsen, Simon Dyhring Larsen

[2016] David Jens Svane Brøgger, Cetin Batur Dilgen and Sumer Bartug Dilgen, Louis Moe Morbitzer Christoffersen

[2015] Morten Mengel Kaastrup, Samuel David Carlstedt (with Volvo busses), Jaafar Maher Taglass, Jeroen Groen, Paul Thedens, Mads Jacob Baandrup, Nina Høgh Jensen (B.Sc.), Daniel Vestergaard Nielsen

[2014] Mark Munthe, Søren Madsen and Nis Peter Lange, Sebastian Arlund Nørgaard, Hlin Vala Adalsteinsdottir, Daniel Vestergaard Nielsen, Thomas Agger (B.Sc.), Christian Ejlersen, Daniel Øland Vonboe

[2013] Joe Alexandersen

[2012] Michael Cucarella Petersen and Søren Caspersen, Paw Møller and Henrik Juul Spietz (B.Sc.)

[2011] Stine Skov Madsen, Joe Alexandersen (B.Eng.), Villads Egede Johansen

[2010] Erik Andreassen and Anders Clausen

[2007] Jonas Dahl, Kristoffer Eriksen and Daniel Kamyno Rasmussen, Rene Matzen and Thomas Harpsøe Poulsen

[2006] Maria Bayard Düring, Morten Pedersen and Mads Peter Christiansen

[2005] Peter Michael Clausen, Brian Rømer, Bogi Laxafoss and Anders Astrup-Larsen

[2004] Andreas H. Nielsen

[2003] Allan Gersborg-Hansen, Christian L. Felter, Charlotte Larsen and Joen Sindholt (B.Sc.)

[1999] Claus B.W. Pedersen and Thomas Buhl, Jeppe Koefoed

[1997] Martin Andersen

[1996] Vinothan Manoharan (B.Sc., Princeton)

Guest students (total of 24)

2023	Ph.D.-Student, Numan Khan (Italy).
2022	Ph.D.-Student, Vanessa Cool (Belgium).
2021	Ph.D.-Student, Tobias Barbier (Belgium).
2020	Postdoc, Gustavo Assis da Silva (Brazil).
2019-2020	Postdoc, Quhao Li (Taiwan).
2019-2020	Ph.D.-Student, Yu Hsin Kuo (Taiwan).
2019-2020	Ph.D.-Student, Yunfeng Luo (Tsinghua China).
2019	Ph.D.-Student, Kai Wu (Tsinghua. China).
2018	Ph.D.-Student, Gustavo Assis da Silva (Brazil).
2017	Ph.D.-Student, Federico Ferrari (Italy).
2016-2018	Ph.D.-Student, Yu Li (Xi'an, China).
2016-2018	Ph.D.-Student, Suna Yan (Xi'an, China).
2016	Ph.D.-Student, Xi Zhao (Dalian, China).
2015	Ph.D.-Student, David Ruiz Gracia (Spain).
2014	Ph.D.-Student, Daniel de Leon (Brazil).
2012	Ph.D.-Student, Byoung-Ug Park (Korea).
2009	Ph.D.-Student, Mathias Schevenels (Belgium).
2009	Ph.D.-Student, Ming Qing Wang (China).
2007	M.Sc.-Student, Benjamin Hessenauer (Germany).
2003	Ph.D.-student, Alberto Donoso (Spain), Topology Optimization
2002	Ph.D.-student, Michael Tellner (Sweden), Topology Optimization
2001–2002	Ph.D.-student, Gil-Ho Yoon (Korea), Wavelets in Topology Optimization.
1999, 2000	Ph.D.-student, Mathias Stolpe (Sweden), Topology optimization.
1999	Ph.D.-student, Thomas Borrvall (Sweden), Topology Optimization.
1998-1999	Ph.D.-student, Miguel Neves (Portugal), Buckling in microstructures.

Research Assistants (incomplete)

1999 Thomas Buhl, *MEMS-design*, MEK, DTU.
1999 Jeppe Koefoed, *MEMS-design*, DTU 1999.
1995 Ulrik Darling Larsen, *Manufacturing Methods for MEMS*, MEK/MIC.