

Esben Skovsen  
Associate Professor  
Department of Materials and Production  
The Faculty of Engineering and Science  
Physics and Mechanics  
Physics  
**Postal address:**  
Skjernvej 4  
A, 5-122  
9220  
Aalborg Ø  
Denmark  
**Email:** es@mp.aau.dk  
**Phone:** +45 9940 7484



## Publications

### **Theory of dielectric photonic crystals sandwiched between parallel metal plates**

Inoue Bendtsen, R., Skovsen, E. & Søndergaard, T. M., 27 Jan 2023, In: *Optics Continuum*. 2, 2, p. 312-326 15 p.

### **Classification of Terahertz Reflection Spectra using Machine Learning Algorithms**

Kristensen, M. H., Cielecki, P. P. & Skovsen, E., 26 Sep 2022, *IRMMW-THz 2022 - 47th International Conference on Infrared, Millimeter, and Terahertz Waves*. IEEE, 9895909. (International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)).

### **Thermal conduction in a densified oxide glass: Insights from lattice dynamics**

Sørensen, S. S., Cielecki, P. P., Johra, H., Bockowski, M., Skovsen, E., Yue, Y. & Smedskjær, M. M., Aug 2022, In: *Materials Today Communications*. 32, 104160.

### **All-dielectric one-dimensional gratings exhibiting Fano resonances in the terahertz region**

Westerkam, A. M., Sonne, J. L. W., Danielsen, K. G., Skovsen, E. & Søndergaard, T. M., Jul 2022, In: *Journal of the Optical Society of America B: Optical Physics*. 39, 7, p. 1723-1729 7 p.

### **Correlating thermal conductivity of oxide glasses with modal characteristics and network topology**

Sørensen, S. S., Cielecki, P. P., Johra, H., Bockowski, M., Skovsen, E. & Smedskjær, M. M., 23 May 2022.

### **Analysis and Classification of Frequency-Domain Terahertz Reflection Spectra Using Supervised and Unsupervised Dimensionality Reduction Methods**

Cielecki, P. P., Kristensen, M. H. & Skovsen, E., Sep 2021, In: *Journal of Infrared, Millimeter and Terahertz Waves*. 42, 9-10, p. 1005-1026 22 p.

### **Fourier transform second harmonic generation for high-resolution nonlinear spectroscopy**

Kristensen, M. H., Kristensen, P. K., Pedersen, K. & Skovsen, E., 1 Mar 2021, In: *Optics Communications*. 482, 126593.

### **Influence of photo-excited charge carriers in silicon wafer in a two-color laser-induced air plasma terahertz emission**

Sorensen, C. B., Guiramand, L., Minasyan, A., Lacroix, C., Degert, J., Tondusson, M., Skovsen, E., Freysz, E. & Abraham, E., 8 Nov 2020, *2020 45th International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz 2020*. IEEE, p. 67-68 2 p. 9370560. (International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, Vol. 2020-November).

### **Theoretical analysis of compact cylindrical microlenses for terahertz photoconductive antennas in the photomixer regime**

Søndergaard, T., Sauer, M. O., Nielsen, C. E. M., Merring-Mikkelsen, L., Sørensen, C. B. & Skovsen, E., 1 Apr 2020, In: *Journal of the Optical Society of America - B - Optical Physics*. 37, 4, p. 1109-1115 7 p.

### **Conical versus Gaussian terahertz emission from two-color laser-induced air plasma filaments**

Sørensen, C. B., Guiramand, L., Degert, J., Tondusson, M., Skovsen, E., Freysz, E. & Emmanuel, A., 2020, In: *Optics Letters*. 45, 7, p. 2132-2135 4 p.

### **Rapid Prototyping of Simple Optical Elements for the Terahertz Domain**

Sørensen, C. B. & Skovsen, E., 1 Oct 2019, *2019 44th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)*. IEEE, p. 1-2 2 p. 8874045

### **Conical vs Gaussian Terahertz Emission from Two-Color Laser-Induced Air Plasma Filaments**

Sørensen, C. B., Degert, J., Tondusson, M., Skovsen, E., Freysz, E. & Abraham, E., Sep 2019, *2019 44th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)*. IEEE, p. 1-2 2 p. 8874322

### **Design of a compact cylindrical micro-lens for efficient out-coupling and collimation of THz radiation from a photoconductive antenna**

Sørensen, C. B., Skovsen, E. & Søndergaard, T. M., Sep 2019, *2019 44th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)*. IEEE, p. 1-2 2 p. 8873723. (International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)).

### **Perspectives on Spectral Resolution in Continuous-Wave Terahertz Spectroscopy at Stand-off Distances**

Kristensen, M. H., Cielecki, P. P. & Skovsen, E., Sep 2019, *IRMMW-THz 2019 - 44th International Conference on Infrared, Millimeter, and Terahertz Waves*. IEEE, 8873947. (International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, Vol. 2019-September).

### **Practical Guidelines for Continuous Wave Terahertz Spectroscopy-Perspectives and Challenges in Stand-off Detection**

Cielecki, P. P., Kristensen, M. H. & Skovsen, E., Sep 2019, *IRMMW-THz 2019 - 44th International Conference on Infrared, Millimeter, and Terahertz Waves*. IEEE, 8874043. (International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, Vol. 2019-September).

### **TERAHERTZ TEKNOLOGI: ud af laboratoriet og ind i fremtiden**

Skovsen, E., 2019, In: *Aktuel Naturvidenskab*. 2019, 2, p. 18-21 4 p.

### **Experimental Binary Optimization of Resonant Dipole Antennas for Remote Sensing below 2THz**

Sørensen, C. B., Søndergaard, T. & Skovsen, E., 25 Oct 2018, *2018 43rd International Conference on Infrared Millimeter and Terahertz Waves, IRMMW-THz 2018*. IEEE, 8509908. (International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)).

### **Theoretical analysis of microstructured gradient-index lens for THz photonics using Greens function integral equation methods**

Søndergaard, T., Brincker, M. & Skovsen, E., 1 Dec 2016, *2016 41st International Conference on Infrared, Millimeter, and Terahertz waves (IRMMW-THz)*. IEEE, 2 p.

### **Microstructured gradient-index lenses for THz photoconductive antennas**

Brincker, M., Karlsen, P., Skovsen, E. & Søndergaard, T., 16 Feb 2016, In: *AIP Advances*. 6, 2, 6 p., 025015.

### **Tunable local excitation of surface plasmon polaritons by sum-frequency generation in ZnO nanowires**

Brincker, M., Pedersen, K. & Skovsen, E., 31 Jul 2015, In: *Optics Communications*. 356, p. 109-112 3 p.

### **Surface plasmon polariton excitation by second harmonic generation in single organic nanofibers**

Simesen, P., Søndergaard, T., Skovsen, E., Fiutowski, J., Rubahn, H-G., Bozhevolnyi, S. I. & Pedersen, K., 11 Jun 2015, In: *Optics Express*. 23, 12

### **An Investigation of the Interaction between Melittin and a Model Lipid Bilayer**

Skovsen, E., Fojan, P. & Slynghorg, M., 31 Mar 2015, In: *Journal of Self-Assembly and Molecular Electronics (SAME)*. 2, p. 53-76 4.

### **Erratum: Plasmonic black gold based broadband polarizers for ultra-short laser pulses (Appl. Phys. Lett. (2013) 103 (211102))**

Skovsen, E., Søndergaard, T., Lemke, C., Stær, T. H., Leissner, T., Eriksen, R. L., Beermann, J., Bauer, M., Pedersen, K. & Bozhevolnyi, S. I., 6 Jan 2014, In: *Applied Physics Letters*. 104, 1, 019903.

#### **Plasmonic black metal polarizers for ultra-short laser pulses**

Søndergaard, T., Skovsen, E., Lemke, C., Stær, T. H., Leissner, T., Eriksen, R. L., Beermann, J., Bauer, M., Pedersen, K. & Bozhevolnyi, S., 2014, *Proceedings of SPIE: Plasmonics: Metallic Nanostructures and Their Optical Properties XII*. Boardman, A. D. (ed.). USA: SPIE - International Society for Optical Engineering, Vol. 9163. 12 p. 916308. (Proceedings of SPIE, the International Society for Optical Engineering, Vol. 9163).

#### **Plasmonic black gold based broadband polarizers for ultra-short laser pulses**

Skovsen, E., Søndergaard, T., Lemke, C., Stær, T. H., Leissner, T., Eriksen, R. L., Beermann, J., Bauer, M., Pedersen, K. & Bozhevolnyi, S., 18 Nov 2013, In: *Applied Physics Letters*. 103, 21, 4 p., 211102.

#### **Study of the tryptophan-terbium FRET pair coupled to silver nanoprisms for biosensing applications**

Gennaro, A. K. D., Gurevich, L., Skovsen, E., Overgaard, M. T. & Fojan, P., 14 Jun 2013, In: *Physical Chemistry Chemical Physics*. 15, p. 8838-8844

#### **Release of Antimicrobial Peptides from Electrospun Nanofibres as a Drug Delivery System**

Eriksen, T. H. B., Skovsen, E. & Fojan, P., Mar 2013, In: *Journal of Biomedical Nanotechnology*. 9, 3, p. 492-498 7 p.

#### **Near-field electrospinning of dielectric-loaded surface plasmon polariton waveguides**

Biagi, G., Stær, T. H. & Skovsen, E., 25 Feb 2013, In: *Optics Express*. 21, 4, p. 4355-4360 6 p.

#### **Pore size dependence of diffuse light scattering from anodized aluminum solar cell backside reflectors**

Yao-Chung, E. T., Søndergaard, T., Skovsen, E., Gurevich, L., Pedersen, K. & Pedersen, T. G., 14 Jan 2013, In: *Optics Express*. 21, S1, p. A84-A95

#### **Local excitation of surface plasmon polaritons by second-harmonic generation in crystalline organic nanofibers**

Skovsen, E., Søndergaard, T., Fiutowski, J., Simesen, P., Lützen, A., Osadnik, A., Rubahn, H-G., Bozhevolnyi, S. I. & Pedersen, K., 16 Jul 2012, In: *Optics Express*. 20, 15, p. 16715-16725

#### **Surface plasmon polariton generation by light scattering off aligned organic nanofibers**

Skovsen, E., Søndergaard, T., Fiutowski, J., Rubahn, H-G. & Pedersen, K., 2012, In: *Optical Society of America. Journal B: Optical Physics*. 29, 2, p. 249-256

#### **Surface plasmon polaritons excitation by second-harmonic generation in KNbO<sub>3</sub> nanowires deposited on thin Ag and Au films**

Skovsen, E., Fojan, P. & Pedersen, K., 2012, *Proceedings of SPIE 2012*. SPIE - International Society for Optical Engineering, Vol. 8424.

#### **Biophysical properties of phenyl succinic acid derivatised hyaluronic acid**

Neves-Petersen, M. T., Klitgaard, S., Skovsen, E., Petersen, S. B., Tømmeraaas, K. & Schwach-Abdellaoui, K., 1 Mar 2010, In: *Journal of Fluorescence*. 20, 2, p. 483-92

#### **Immobilization of biomolecules onto surfaces according to ultraviolet light diffraction patterns**

Petersen, S. B., Gennaro, A. K. D., Neves Petersen, T., Skovsen, E. & Parracino, A., 2010, In: *Applied Optics*. 49, 28, p. 5344-5350

#### **Flash photolysis of cutinase: identification and decay kinetics of transient intermediates formed upon UV excitation of aromatic residues**

Neves Petersen, T., Klitgaard, S., Skovsen, E., Pascher, T., Polivka, T., Petersen, S. B., Yartsev, A. & Sundström, V., 2009, In: *Biophysical Journal*. 97, 1, p. 211

#### **Immobilizing Biomolecules Near the Diffraction Limit**

Skovsen, E., Petersen, M. T. N., Gennaro, A. K. D., Duroux, L. P. & Petersen, S. B., 2009, In: *Journal of Nanoscience and Nanotechnology*. 9, 7, p. 4333-4337 5 p.

**Photonic immobilization of high-density protein arrays using Fourier optics**

Skovsen, E., Kold, A. B., Neves Petersen, T. & Petersen, S. B., 2009, In: *Proteomics*. 9, 15, p. 3945-3948 4 p.

**Printing Novel Molecular Architectures with Micrometer Resolution Using Light**

Petersen, M. T. N., Crookshanks, M., Skovsen, E., Duroux, L. & Petersen, S. B., 2009, In: *Journal of Nanoscience and Nanotechnology*. 9, 6, p. 3372-3381

**Corrigendum to "Using light to bioactivate surfaces: A new way of creating oriented, active immunobiosensors" [Appl. Surf. Sci. 254 (4) (2007) 1126-1130] (DOI:10.1016/j.apsusc.2007.09.083)**

Duroux, M., Gurevich, L., Neves-Petersen, M. T., Skovsen, E., Duroux, L., Borrebaeck, C. A. K., Wingren, C. & Petersen, S. B., 30 Dec 2008, In: *Applied Surface Science*. 255, 5 PART 2, 1 p.

**Light-induced immobilisation of biomolecules as an attractive alternative to micro-droplet dispensing-based arraying technologies: Erratum**

Duroux, M., Skovsen, E., Neves-Petersen, M. T., Duroux, L., Gurevich, L., Borrebaeck, C. A. K., Wingren, C. & Petersen, S. B., 1 Mar 2008, In: *Proteomics*. 8, 5, 1 p.

**Corrigendum to: Using light to bioactivate surfaces: A new way of creating oriented, active immunobiosensors (vol 254, pg 1126, 2007)**

DUROUX, M., GUREVICH, L., Neves Petersen, M. T., SKOVSEN, E., DUROUX, L., BORREBAECK, CAK., WINGREN, C. & PETERSEN, SB., 2008, In: *Applied Surface Science*. 255, 5, Part 2, p. 3470

**Coupling an element via thiol binding involves generating element; irradiating element to form thiol group, and incubating irradiated element to form coupling; or incubating the element, and irradiating element**

Neves Petersen, T., Petersen, S. B., Skovsen, E., Duroux, M. & Duroux, L., 2008, IPC No. C07K-017/00C07K-017/14

**Light-induced immobilisation of biomolecules as an attractive alternative to micro-droplet dispensing-based arraying technologies (vol 7, pg 3491, 2007): correction**

Duroux, M., Skovsen, E., Neves Petersen, T., Duroux, L., Gurevich, L., Borrebaeck, C. A. K., Wingren, C. & Petersen, S. B., 2008, In: *Proteomics*. 8, 5, p. 1113 1 p.

**New device comprises a light source emitting light and an object, useful for producing a microarray or a biosensor and immobilizing molecules and material deposition**

Neves Petersen, T., Petersen, S. B., Skovsen, E., Duroux, M. & Duroux, L., 2008, IPC No. B01J-019/00, Patent No. WO2008077407, 7 Mar 2008

**Reaching (sub-)micrometer resolution of photo-immobilized proteins using diffracted light beams**

Skovsen, E., Neves Petersen, T., Petersen, S. B. & Duroux, L., 2008, In: *Proceedings of SPIE, the International Society for Optical Engineering*. 6848

**Role of Solvent, pH, and Molecular Size in Excited-State Deactivation of Key Eumelanin Building Blocks: Implications for Melanin Pigment Photostability**

Gauden, M., Pezzella, A., Panzella, L., Neves Petersen, T., Skovsen, E., Petersen, S. B., Mullen, K. M., Napolitano, A., d'Ischia, M. & Sundström, V., 2008, In: *Journal of the American Chemical Society*. 130, 50, p. 17038-17043

**Size dependent deactivation of the excited state of DHICA**

Gauden, M., Pezzella, A., Panzella, L., Neves Petersen, T., Skovsen, E., d'Ischia, M. & Sundstrom, V., 2008, In: *Pigment Cell & Melanoma Research*. 2, p. 296-296

**Light-induced immobilisation of biomolecules as an attractive alternative to microdroplet dispensing-based arraying technologies**

Crookshanks, M., Skovsen, E., Petersen, M. T. N., Duroux, L., Gurevich, L. & Petersen, S. B., 2007, In: *Proteomics*. 7, 19, p. 3491-3499

#### **Light-Powered Molecular Engineering: a new technology for medical safety applications**

Neves Petersen, T., Crookshanks, M., Skovsen, E., Duroux, L. & Petersen, S. B., 2007, *Electro-Optical Remote Sensing, Detection, and Photonic Technologies and Their Applications: Proceedings of the SPIE*. Kamerman, G. W., Steinvall, O. K., Lewis, K. L., Krapels, K. A., Carrano, J. C. & Zukauskas, A. (eds.). p. 67391A

#### **Molecular Printing Using UV-Assisted Immobilization of Biomolecules**

Skovsen, E., Crookshanks, M., Petersen, M. T. N., Duroux, L. & Petersen, S. B., 2007, In: *International Journal of Optomechatronics*. 1, 4, p. 383-391

#### **Novel photonic technique creates micrometer resolution protein arrays and provides a new approach to coupling of genes, peptide hormones and drugs to nanoparticle carriers**

Duroux, M., Duroux, L., Petersen, M. T. N., Skovsen, E. & Petersen, S. B., 2007, In: *Applied Surface Science*. 253, 19, p. 8125-8129

#### **Photonics and Immobilisation of Biomolecules**

Duroux, M., Skovsen, E., Neves Petersen, T., Duroux, L. & Petersen, S. B., 2007, *2007 Asia Optical Fiber Communication and Optoelectronics Conference*. IEEE, p. 293-295

#### **Photonics and Microarray Technology**

Skovsen, E., Crookshanks, M., Neves Petersen, T., Duroux, L. & Petersen, S. B., 2007, *Optical Sensing Technology and Applications*. Baldini, F., Homola, J., Lieberman, R. A. & Miler, M. (eds.).

#### **Using light to bioactivate surfaces: a new way of creating oriented, active immunobiosensors**

Crookshanks, M., Gurevich, L., Petersen, M. T. N., Skovsen, E., Duroux, L. & Petersen, S. B., 2007, In: *Applied Surface Science*. 254, 4, p. 1126-1130

#### **Using light to bioactivate surfaces: A new way of creating oriented, active immunobio sensors**

DUROUX, M., GUREVICH, L., NEVES-PETERSEN, MT., SKOVSEN, E., DUROUX, L. & PETERSEN, SB., 2007, *Symposium on Laser Synthesis and Processing of Advanced Materials held at the E-MRS 2007 Spring Meeting*.

#### **Coupling of Elements**

Petersen, M. T. N., Crookshanks, M., Duroux, L., Duroux, L. & Skovsen, E., 2006, Patent No. 21122006

#### **Femtosecond studies of the mechanisms behind UV-light induced immobilization of proteins**

Petersen, M. T. N., Skovsen, E., Petersen, S. B., Crookshanks, M., Duroux, L. & Klitgaard, S., 2006.

#### **Light induced material deposition by molecular immobilization**

Petersen, M. T. N., Petersen, S. B., Crookshanks, M., Duroux, L. & Skovsen, E., 2006, Patent No. DHE P80602816DK00M

#### **Novel Photonic Technique Creates Micrometer Resolution Multi-sensor Arrays and Provides a New Approach to Coupling of Genes, Nucleic Acids, Peptide Hormones and Drugs to Nanoparticle Carriers**

Petersen, M. T. N., Skovsen, E., Petersen, S. B., Crookshanks, M. & Duroux, L., 2006.

#### **Optical Detection of Singlet Oxygen from Single Cells**

Snyder, J., Skovsen, E., Lambert, J. D. C., Poulsen, L. & Ogilby, P. R., 2006, In: *Physical Chemistry Chemical Physics*. 8, 37, p. 4280-4293 13 p.

#### **Two Photon Singlet Oxygen Microscopy: the challenges of working with single cells**

Skovsen, E., Snyder, J. W., Lambert, J. D. C. & Ogilby, P. R., 2006, In: *Photochemistry and Photobiology*. 82, p. 1187-1197

**Lifetime and Diffusion of Singlet Oxygen in a Cell**

Skovsen, E., Snyder, J. W., Lambert, J. D. C. & Ogilby, P. R., 2005, In: Journal of Physical Chemistry B. 109, 18, p. 8570-8573

**Lifetime and diffusion of singlet oxygen in a cell.**

Skovsen, E., Snyder, J., Lambert, J. D. C. & Ogilby, P. R., 2005, In: Journal of Physical Chemistry Part B: Condensed Matter, Materials, Surfaces, Interfaces & Biophysical. 109, p. 8570-8573

**Subcellular, Time-Resolved Studies of Singlet Oxygen in Single Cells**

Skovsen, E., Snyder, J. W., Lambert, J. D. C. & Ogilby, P. R., 2005, In: Ceramic Abstracts. 127, 42, p. 14558-14559

**Subcellular, time-resolved studies of singlet oxygen in single cells.**

Snyder, J., Skovsen, E., Lambert, J. D. C. & Ogilby, P. R., 2005, In: Journal of the American Chemical Society. 127, p. 14558-14559

**Two-photon photosensitized production of singlet oxygen in water**

Skovsen, E., Frederiksen, K. P., McIlroy, S. P., Nielsen, C., Nikolajsen, L., Jørgensen, M., Mikkelsen, K. V. & Ogilby, P. R., 2005, In: Ceramic Abstracts. 127, 1, p. 255-269

**Singlet oxygen microscope: From phase-separated polymers to single biological cells**

Snyder, J. W., Zebger, I., Gao, Z., Poulsen, L., Frederiksen, P. K., Skovsen, E., McIlroy, S. P., Klinger, M., Andersen, L. K. & Ogilby, P. R., 1 Nov 2004, In: Accounts of Chemical Research. 37, 11, p. 894-901 8 p.

**Quantum state tomography of dissociating molecules**

Skovsen, E., Stapelfeldt, H., Juhl, S. & Mølmer, K., 2003, In: Physical Review Letters. 91, p. 090406

**Photodissociation of laser aligned iodobenzene: Towards selective photoexcitation**

Poulsen, M. D., Skovsen, E. & Stapelfeldt, H., 1 Aug 2002, In: Journal of Chemical Physics. 117, 5, p. 2097-2102 6 p.

**Imaging and Control of Interfering Wave Packets in a Dissociating Molecule**

Skovsen, E., Machholm, M., Ejdrup, T., Thøgersen, J. & Stapelfeldt, H., 1 Jan 2002, In: Physical Review Letters. 89, 13