Stela Canulescu, PhD
Head of the Photovoltaic Materials and Systems group
Department of Photonics Engineering
Postal address:
Frederiksborgvej 399
130, 149
4000
Roskilde
Denmark
Email: stec@fotonik.dtu.dk
Phone: 46774519
Web address: http://www.fotonik.dtu.dk, http://www.fotonik.dtu.dk

Research Interests: Thin-film solar cells; 2D materials and vdW heterostructures; Tandem solar cells; spectroscopy

Activities

Geometry-induced bulk photovoltaic effect in WS2 nanoribbons
Ghimire, G. (Other) & Canulescu, S. (Invited speaker)
28 Jun 2026 → 2 Jul 2026

Optimizing hydrothermally deposited Sb2S3 solar absorbers through annealing thermal profile
Enevoldsen, A. M. P. (Speaker), Gilshtein, E. (Other), Canulescu, S. (Other), Gupta, H. M. (Other), Ghaffari-Tabrizi, F. (Guest lecturer) & Nistal, D. (Other)
17 Jun 2026 → 19 Jun 2026

Effect of annealing thermal profiles on the performance of hydrothermally deposited Sb2S3 thin films for photovoltaic applications
Enevoldsen, A. M. P. (Speaker), Gilshtein, E. (Other), Canulescu, S. (Other), Gupta, H. M. (Other), Nistal, D. (Other) & Ghaffari-Tabrizi, F. (Other)
28 May 2026

Spectroscopy of Solar Cells
Canulescu, S. (Guest lecturer)
11 Jun 2025 → 13 Jun 2025

Antimony Sulfide (Sb_2S_3) with Tailored Crystallographic Orientation
Canulescu, S. (Invited speaker)
7 Apr 2025 → 11 Apr 2027

Femtosecond UV laser enhancement of silver nanowires based transparent conductive electrodes
Miakota, D. I. (Speaker), Moltke, A. (Other), Smith, C. R. (Other), Jektvik, C. (Other), Bang, O. (Other) & Canulescu, S. (Other)
29 Sept 2024 → 4 Oct 2024

The use of femtosecond UV laser for selective layer processing of CIGS thin-film solar cells
Miakota, D. I. (Speaker), Moltke, A. (Other), Smith, C. R. (Other), Bang, O. (Other), Zimmermann, A. (Other) & Canulescu, S. (Other)
29 Sept 2024 → 4 Oct 2024

Optimizing the crystallization and orientation of Sb2S3 deposited via sputtering and post-annealing
Gupta, H. M. (Guest lecturer), Tsekou, A. (Guest lecturer), Miakota, D. I. (Guest lecturer), Gilshtein, E. (Guest lecturer), Pantleon, K. (Guest lecturer), Madsen, M. (Guest lecturer) & Canulescu, S. (Guest lecturer)
26 Jun 2024 → 28 Jun 2024

Systematic study to understand the origin of luminescent emitters in hexagonal boron nitride(hBN) generated by irradiation engineering
Chamaparambil Sindhuraj, P. (Speaker), Caridad, J. (Other), Fischer, M. (Other), Miakota, D. I. (Other), A. Delgado-Notario, J. (Other), Canulescu, S. (Other), Xiao, S. (Other), Wubs, M. (Other) & Leitherer-Stenger, N. C. (Other)
25 Jun 2024 → 28 Jun 2024

Investigation of crystallization and orientation of Sb2S3 absorbers and their photovoltaic performance
Gupta, H. M. (Guest lecturer), Tsekou, A. (Guest lecturer), Miakota, D. I. (Guest lecturer), Ghaffari-Tabrizi, F. (Guest lecturer), Pantleon, K. (Guest lecturer), Madsen, M. (Guest lecturer) & Canulescu, S. (Guest lecturer)
27 May 2024 → 31 May 2024

Alkali-assisted synthesis of multilayer crystalline MoS2 nanoribbons with 2D edges, and Schottky barrier observation on MoS2 nanoribbon-Au/Cr junction
Miakota, D. I. (Speaker), Canulescu, S. (Invited speaker), Ghimire, G. (Other), Malureanu, R. (Other), Larsen, F. (Other) & Ulaganathan, R. K. (Other)
20 May 2024 → 23 May 2024

Systematic study to understand the origin of luminescent emitters in hBN generated by irradiation engineering
Chamaparambil Sindhuraj, P. (Speaker), Caridad, J. (Other), Fischer, M. (Other), Miakota, D. I. (Other), Canulescu, S. (Other), Xiao, S. (Other), Wubs, M. (Other) & Leitherer-Stenger, N. (Other)
27 Feb 2024 → 28 Feb 2024

UV source for solar cell processing and scatterometry
Moltke, A. (Speaker), Smith, C. R. (Other), Miakota, D. I. (Other), Jektvik, C. (Other), Davidsen, R. S. (Guest lecturer) & Canulescu, S. (Other)
30 Jan 2024 → 1 Feb 2024

Development of n-type buffer layer and window layer for low band gap CIS solar cells
Gupta, H. M. (Guest lecturer), Canulescu, S. (Guest lecturer), De Wild, J. (Guest lecturer) & Vermang, B. (Guest lecturer)
5 Jul 2023 → 7 Jul 2023

MRS Spring Meeting
Canulescu, S. (Speaker)
10 Apr 2023 → 14 Apr 2023

An approach to grow 2D materials heterostructures directly based on pulsed laser deposition of solid oxide precursors
Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. (Other), Geohegan, D. (Other) & Canulescu, S. (Other)
7 Nov 2022 → 8 Nov 2022

A direct growth of 2D materials heterostructures based on pulsed laser deposition of solid oxide precursors
Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. (Other), Geohegan, D. (Other), Engberg, S. L. J. (Other) & Canulescu, S. (Other)
25 Jul 2022 → 27 Jul 2022

Alkali halide promoter induced synthesis of crystalline quasi-1D MoS2 nanoribbons from PLD grown MoOx precursor
Canulescu, S. (Guest lecturer)
5 Jul 2022 → 8 Jul 2022

Direct growth of 2D materials heterostructures based on pulsed laser deposition of solid oxide precursors
Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. (Other), Geohegan, D. (Other), Engberg, S. L. J. (Other) & Canulescu, S. (Other)
5 Jul 2022 → 8 Jul 2022

A potential approach to grow van der Waals heterostructures based on pulsed laser deposition of solid oxide precursors for thin film photovoltaics

Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. (Other), Geohegan, D. (Guest lecturer), Engberg, S. L. J. (Other), Bertoldo, F. F. (Other), Thygesen, K. S. (Other) & Canulescu, S. (Other)
30 May 2022 → 3 Jun 2022

Laser-assisted Synthesis of 2D Quantum Materials and Heterostructures
Canulescu, S. (Invited speaker)
24 Apr 2022 → 29 Apr 2022

Laser-assisted Synthesis of 2D Quantum Materials and Heterostructures
Canulescu, S. (Guest lecturer)
24 Apr 2022

12th European Kesterite Workshop
Canulescu, S. (Organizer), Engberg, S. L. J. (Organizer) & Andreasen, J. W. (Organizer)
9 Feb 2022 → 11 Feb 2022

A Two-Step Approach Towards the Growth of WS2 Monolayers from Solid Oxide Precursors
Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. (Other), Geohegan, D. (Guest lecturer), Bertoldo, F. F. (Other), Thygesen, K. S. (Other) & Canulescu, S. (Panel member)
9 Feb 2022 → 11 Feb 2022

Two-Dimensional Tungsten Disulfide Monolayers Synthesized from Solid Oxide Precursor Grown by Pulsed Laser Deposition
Miakota, D. I. (Speaker), Ghimire, G. (Other), Ulaganathan, R. (Other), Unocic, R. R. (Other), Geohegan, D. B. (Other), Engberg, S. L. J. (Other), Bertoldo, F. F. (Other), Thygesen, K. S. (Other) & Canulescu, S. (Other)
6 Dec 2021 → 8 Dec 2021

High-quality WS2 monolayers growth via two-step approach based on pulsed laser deposition of tungsten oxide
Miakota, D. I. (Speaker), Ghimire, G. (Other), Geohegan, D. (Other), Unocic, R. R. (Other) & Canulescu, S. (Other)
26 Oct 2021 → 29 Oct 2021

Two-dimensional tungsten disulfide monolayers synthesized from epitaxial oxides grown by Pulsed Laser Deposition
Miakota, D. I. (Speaker), Ghimire, G. (Other), Unocic, R. R. (Other), Engberg, S. L. J. (Other), Bertoldo, F. F. (Other), Schou, J. (Other), Thygesen, K. S. (Other), Geohegan, D. B. (Other) & Canulescu, S. (Other)
31 May 2021 → 3 Jun 2021

Scientific Reports (Journal)
Canulescu, S. (Reviewer)
2021 → …

Enabling high-efficiency chalcogenide/Si tandem solar cells: A comparative study of different chalcogenide top cells on a thermally resilient Si bottom cell
Martinho, F. M. A. (Speaker), Hajijafarassar, A. (Other), Saini, N. (Other), Larsen, J. (Other), Engberg, S. L. J. (Other), Stamate, E. (Other), Schou, J. (Other), Platzer-Björkman, C. (Other), Vines, L. (Other), Canulescu, S. (Other) & Hansen, O. (Other)
26 Nov 2020

Cu2ZnSnS4 solar cells via spin-coating: From DMSO ink to film
Engberg, S. L. J. (Speaker), Gansukh, M. (Other), Martinho, F. M. A. (Other), Küngas, R. (Other), Stamate, E. (Other), Hansen, O. (Other), Canulescu, S. (Other) & Schou, J. (Other)
28 May 2020

Towards atomically controlled growth of layered structures using PLD
Canulescu, S. (Guest lecturer)
10 Sept 2019

Band alignment at the CdS/ACZTS interface studied by soft X-ray spectroscopy
Canulescu, S. (Guest lecturer)
29 May 2019

A novel method for the synthesis of 2D materials
Canulescu, S. (Guest lecturer)
27 May 2019

Monolithic tandem solar cell potential of CZTS on TOPCon Si
Martinho, F. M. A. (Invited speaker), Hajijafarassar, A. (Other), Stulen, F. (Other), Grini, S. (Other), Mariño, S. L. (Other), Espindola Rodriguez, M. (Other), Döbeli , M. (Other), Canulescu, S. (Other), Stamate, E. (Other), Gansukh, M. (Other), Engberg, S. L. J. (Other), Hansen, O. (Other), Crovetto, A. (Other), Vines, L. (Other) & Schou, J. (Other)
24 Apr 2019

Monolithic CZTS-on-Silicon Tandem Solar Cells: Prospects and Challenges
Hajijafarassar, A. (Speaker), Martinho, F. M. A. (Other), Stulen, F. (Other), Grini, S. (Other), Shearer, D. C. (Other), Iandolo, B. (Other), Crovetto, A. (Other), Mariño, S. L. (Other), Canulescu, S. (Other), Schou, J. (Other) & Hansen, O. (Other)
8 Apr 2019

Investigation of Ti-based barrier layers for application in monolithic Silicon-Chalcogenide tandem solar cells
Hajijafarassar, A. (Speaker), Martinho, F. M. A. (Other), Grini, S. (Other), Stulen, F. (Other), Vines, L. (Other), Shearer, D. C. (Other), Döbeli , M. (Other), Crovetto, A. (Other), Mariño, S. L. (Other), Canulescu, S. (Other), Schou, J. (Other) & Hansen, O. (Other)
30 Nov 2018

Assessment of the photovoltaic properties of CZTS grown on representative Si solar cell structures for monolithic CZTS/Si tandem applications
Martinho, F. M. A. (Speaker), Hajijafarassar, A. (Other), Mariño, S. L. (Other), Espindola Rodriguez, M. (Other), Gansukh, M. (Other), Canulescu, S. (Other), Stamate, E. (Other), Engberg, S. L. J. (Other), Hansen, O. (Other), Crovetto, A. (Other) & Schou, J. (Other)
29 Nov 2018

Selective Area Growth of GaAs Nanowires on Silicon for photovoltaic applications
Lebedkina, E. (Speaker), Viazmitinov, D. (Other), Canulescu, S. (Other) & Semenova, E. (Other)
24 Sept 2018 → 27 Sept 2018

Epitaxial growth of GaAs Nanowires on Silicon substrate for photovoltaic applications
Lebedkina, E. (Speaker), Viazmitinov, D. (Other), Canulescu, S. (Other) & Semenova, E. (Other)
12 Sept 2018 → 14 Sept 2018

Development of CZTS absorbers by sputter deposition for application in CZTS/Si tandem photovoltaics: The Copper problem
Martinho, F. M. A. (Speaker), Hajijafarassar, A. (Other), Canulescu, S. (Other), Stamate, E. (Other), Mariño, S. L. (Other), Espindola Rodriguez, M. (Other), Gansukh, M. (Other), Engberg, S. L. J. (Other), Hansen, O. (Other), Crovetto, A. (Other) & Schou, J. (Other)
22 Jun 2018

Investigation of TiN and TiO2 as barrier layer in Silicon/Chalcogenide Tandem Solar Cells
Hajijafarassar, A. (Speaker), Martinho, F. M. A. (Other), Crovetto, A. (Other), Canulescu, S. (Other), Pedersen, T. (Other), Mariño, S. L. (Other), Schou, J. (Other) & Hansen, O. (Other)
19 Jun 2018

2017 MRS fall meeting & Exhibition
Canulescu, S. (Participant)

1 Dec 2017

Pulsed laser deposition (PLD) of the CZTS absorber for thin solar cells with up to 5.2-% -efficiency
Schou, J. (Guest lecturer), Cazzaniga, A. C. (Other), Canulescu, S. (Other), Crovetto, A. (Other), Ettlinger, R. B. (Other), Pryds, N. (Guest lecturer), Hansen, O. (Other), Yan, C. (Other), Sun, K. (Other) & Hao, X. (Other)
26 Jun 2017 → 30 Jun 2017

EMRS Spring meeting 2017
Schou, J. (Participant), Cazzaniga, A. C. (Participant), Canulescu, S. (Organizer), Ettlinger, R. B. (Participant), Pryds, N. (Participant), Hansen, O. (Organizer), Crovetto, A. (Organizer), Yan, C. (Participant), Sun, K. (Participant) & Hao, X. (Participant)
23 May 2017

E-MRS Spring Meeting 2017
Canulescu, S. (Organizer)
22 May 2017 → 26 May 2017

High-energy deposition methods for CZTS and CTS solar cells
Schou, J. (Other), Ettlinger, R. B. (Guest lecturer), Cazzaniga, A. C. (Other), Canulescu, S. (Other), Normann, K. (Other), Pattini, F. (Other), Rampino, S. (Other) & Gilioli, E. (Other)
22 May 2017 → 23 May 2017

Materials Research Society Spring Meeting 2017
Schou, J. (Organizer), Cazzaniga, A. C. (Participant), Crovetto, A. (Participant), Ettlinger, R. B. (Participant), Engberg, S. L. J. (Participant), Canulescu, S. (Participant), Pryds, N. (Participant), Hansen, O. (Participant), Yan, C. (Participant), Sun, K. (Participant) & Hao, X. (Participant)
17 Apr 2017 → 21 Apr 2017

Applied Physics A: Materials Science & Processing (Journal)
Canulescu, S. (Reviewer)
1 Jan 2017

Angular distribution of ablated species from a multicomponent target in vacuum and background gas
Canulescu, S. (Invited speaker)
29 Aug 2016 → 2 Sept 2016

EMRS Spring Meeting 2016
Canulescu, S. (Speaker)
4 May 2016

7th International Conference on Photo-Excited Processes and Applications
Canulescu, S. (Speaker)
16 Aug 2010

Investigating the fragmentation of C60 by Matrix Assisted Pulsed Laser Evaporation
Canulescu, S. (Speaker)
15 Aug 2010 → 20 Aug 2010

9th International Conference on Laser Ablation
Canulescu, S. (Speaker)
27 Sept 2007

Applied Physics A: Materials Science & Processing (Journal)
Canulescu, S. (Reviewer)
1 Jan 2007

Projects

CHALSOL: Chalcogenide solar cells of CZTS-Copper Zinc Tin Sulfide. A new, high-efficiency material for low-tech solar cells of earthabundant and environmentally friendly elements
Canulescu, S. (Project Participant)
01/01/2013 → 31/12/2016

Controllable doping in two-dimensional materials
Canulescu, S. (PI) & Jensen, P. F. (Project Participant)
05/09/2022 → 19/12/2022

Development of n-type buffer and window layer for low band gap Cu(In,Ga)Se2 solar cells
Canulescu, S. (PI) & Gupta , H. M. (Project Participant)
19/09/2022 → 18/02/2023

Fermi-level Depinning of Wafer-Scale MoS2 using Functionalized CVD Graphene Interlayers
Canulescu, S. (PI) & Kalogeropoulos, A. (Project Participant)
01/09/2022 → 01/02/2023

GDOES and HRXRD for the characterization of PLD TiO2 thin films
Canulescu, S. (PI) & Ng, J. W. (Project Participant)
10/01/2023 → 10/06/2023

Junctionless nanostructure solar cells
Canulescu, S. (PI)
01/01/2024 → 31/03/2026

New thin solar cell films makes silicon cells better
Gansukh, M. (PhD Student), Lippert, T. (Examiner), Redinger, A. (Examiner), Ou, H. (Examiner), Canulescu, S. (Main Supervisor) & Schou, J. I. (Supervisor)
Technical University of Denmark
01/04/2017 → 30/09/2020

New thin solar cell films makes silicon cells better
Martinho, F. M. A. (PhD Student), Lincot, D. (Examiner), Seger, B. (Examiner), Canulescu, S. (Main Supervisor), Schou, J. I. (Supervisor), Stamate, E. (Supervisor) & Silva, E. S. (Examiner)
Forskningsrådsfinansiering
01/08/2017 → 04/11/2020

New, tunable n-type material for emerging thin-film solar cells
Canulescu, S. (Project Participant), Engberg, S. L. J. (PI) & Tsekou, A. (PhD Student)
17/04/2023 → 16/04/2026

Novel n-type Materials for Emerging Thin-Film Solar Cells
Tsekou, A. (PhD Student), Canulescu, S. (Main Supervisor), Engberg, S. L. J. (Supervisor) & Stamate, E. (Supervisor)
15/04/2023 → 24/09/2026

One-Dimensional (1D) structured materials for improved charge transport in Inorganic Thin- Film Photovoltaics
Canulescu, S. (PI)
01/03/2023 → 31/08/2026

One-Dimensional (1D) structured materials for improved charge transport in Inorganic Thin- Film Photovoltaics
Gupta, H. M. (PhD Student), Canulescu, S. (Main Supervisor), Pantleon, K. (Supervisor) & Madsen, M. (Supervisor)
15/05/2023 → 24/09/2026

One-Dimensional (1D) structured materials for improved charge transport in Inorganic Thin- Film Photovoltaics
Canulescu, S. (PI)

One-Dimensional (1D) structured materials for improved charge transport in Inorganic Thin- Film Photovoltaics
Canulescu, S. (Main Supervisor)
15/05/2023 → 15/05/2026

ODAAS: Optically Designed Anodized Aluminum Surfaces
Canulescu, S. (Project Participant)
01/09/2011 → 01/09/2015

Photonic crystallization of antimony chalcogenide-based thin-film solar cells
Enevoldsen, A. M. P. (PhD Student), Canulescu, S. (Main Supervisor) & Gilshtein, E. (Supervisor)
01/05/2025 → 30/04/2028

Sb2S3 solar cells
Canulescu, S. (PI) & Tsekou, A. (Project Participant)
01/09/2022 → 01/02/2023

THz-enabled electron emission devices
Lange, S. J. (PhD Student), Jepsen, P. U. (Main Supervisor), Broeng, J. (Supervisor), Canulescu, S. (Examiner), Hegmann, F. (Examiner) & Kärtner, F. X. (Examiner)
Technical University of Denmark
15/12/2016 → 04/03/2020

Two-dimensional Materials: Synthesis, Characterization, and Applications
Miakota, D. I. (PhD Student), Alshareef, H. N. 1. (Examiner), McCloskey, D. 2. (Examiner), Canulescu, S. (Main Supervisor) & Yartsev, A. (Supervisor)
15/10/2019 → 01/03/2023

Versatile van der Waals heterostructures
Canulescu, S. (PI)
01/04/2019 → 30/09/2022