

Sunday Afternoon, November 3, 2024

Nanoscale Science and Technology Plenary Session (INVITED SESSION)

Room 114 - Session NSP-SuP

Nanoscale Science and Technology Plenary Session (INVITED SESSION)

Moderator: Nikolai Klimov, NIST

3:00pm NSP-SuP-1 NSTD Nanotechnology Recognition Award Talk: **The Energy Challenge from a Materials Perspective**, *Federico Rosei*¹, Institut National de la Recherche Scientifique, Centre Énergie, Matériaux et Télécommunications, Canada

INVITED

Sustainability is the overarching challenge of modern times. In this context, replacing fossil fuels with renewables is urgent and critical. This presentation focuses on next generation (solar) energy technologies from a materials perspective. We study structure property/relationships in advanced materials, emphasizing multifunctional systems that exhibit several functionalities. Such systems are then used as building blocks for the fabrication of various emerging technologies. In particular, nanostructured materials synthesized via the bottom-up approach present an opportunity for future generation low cost and low energy intensive manufacturing of devices. We focus in particular on recent developments in solar technologies, including third generation photovoltaics, solar hydrogen production, luminescent solar concentrators and other optoelectronic devices. [1-20].

References

[1] Appl. Cat. B 264, 118526 (2020); [2] Adv. Func. Mater. 30, 1908467 (2020); [3] J. Mater. Chem. A 8, 20698 (2020); [4] Nano Energy 79, 105416 (2021); [5] Nano Energy 81, 105626 (2021); [6] Small Meth. 8, 2300133 (2024); [7] ACS Appl. Mater. Int. 15, 56413 (2023); [8] J. Mater. Chem. A 11, 23821 (2023); Chem. Eng. J. 474, 145830 (2023); [9] ACS Appl. Mater. Int. 15, 34797 (2023); [10] Nano Energy 111, 108438 (2023); [11] Small 19, 2300606 (2023); [12] ACS Appl. Mat. Int. 14, 54790 (2022); [13] Nano Energy 100, 107524 (2022); [14] Chem. Eng. J. 446, 137312 (2022); [15] Small 18, 2201815 (2022); [16] Small Meth. 6, 2101470 (2022); [17] Chem. Eng. J. 435, 135037 (2022); [18] Chem. Eng. J. 429, 132425 (2022); [19] Small 20 [https://onlinelibrary.wiley.com/toc/16136829/2024/20/22], 2306203 (2024); [20] J. Mater. Chem. A 12, 11644 (2024).

Author Index

Bold page numbers indicate presenter

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Rosei, F.: NSP-SuP-1, **1**