PADERBORN UNIVERSITY | Collaborative Research Center TRR 142 | tu dortmund university

PhoQS · CeOPP Center for Optoelectronics and Photonics Paderborn

PHOTONICS LECTURE

MONDAY, 22 APRIL 2024 | 16:00

PROF. DR. RALF B. WEHRSPOHN

LECTURE HALL O2

The concept of hyperuniformity in optics

In classical photonics and integrated optics, large area photonic structures are either assumed to be periodic or disordered. For both states, physical models exist to describe the photonic properties. Since pioneering work of Torquato in 2018 [1], a intermediate state has been defined and mathematically described: the tailored disorder or the hyperuniformity. An introduction to this new state of hyperuniformity is given, a model systems for 2D optical hyperuniform materials is shown [2-4] and the limits of the model system are discussed. Application of this state are shown for solar cells [5] and light emitting diodes [6]. This work was done in collaboration with the KIT and is funded by the DFG.

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[1] S. Torquato, Phys. Reports, 745 (2018) 1.
[2] P. Piechulla, A. N. Sprafke, R. B Wehrspohn et al. DOI: https://doi.org/10.1002/adom.201701272
[3] P. Piechulla, A. N. Sprafke, R. B Wehrspohn et al., DOI: https://doi.org/10.1002/adom.202100186
[4]P. Piechulla, A. N. Sprafke, R. B Wehrspohn et al. DOI: https://doi.org/10.1002/admi.202201395
[5] P. Piechulla, A. N. Sprafke, R. B Wehrspohn et al. DOI:; https://doi.org/10.1021/acsphotonics.1c00601
[6] P. Piechulla, A. N. Sprafke, R. B Wehrspohn et al. , DOI: https://doi.org/10.1002/adom.202202557