

量子物理学・ナノサイエンス第 123 回特別セミナー

Accelerating photonic inverse design

講師 : **Professor Steven G. Johnson**

Massachusetts Institute of Technology, USA (MIT)

日程 : 10 月 22 日 (木) 13:30 -

場所 : 本館 3 階 345 理学院第 2 会議室

概 要

Johnson 教授は、フォトニック結晶の研究初期から MIT において理論側面で分野をリードした著名な研究者で、"Photonic Crystals-Molding the Flow of Light"の著者としても知られています。今回本学を訪問されるにあたって下記の内容で講演を行って頂くことになりましたので、関心のある方はぜひご参加ください。

"Inverse design" is the technique of using large-scale optimization (over thousands or even millions of parameters) to allow the computer to "discover" the best arrangement of materials for a given application, often leading to non-intuitive freeform geometries. In contrast to machine learning, this is typically model-driven optimization, based on accurate first-principles physics simulations, rather than data-driven. However, there are many problems for which simply plugging the most straightforward computational model into an optimization algorithm yields an intractable problem, and non-obvious transformations are required to obtain a good solution with reasonable effort. We illustrate these ideas with several design problems from photonics, including incoherent emission, laser optimization, and the design of optical filters.

連絡教員 **納富 雅也 (内線 3831)**