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https://top.physik.hu-berlin.de/teaching

SoSe 2020

April 20, 2020

Computational Photonics: Information Sheet

1 The lecture will take place on Thursdays from 9 to 11, beginning on April 23. It is accompanied by bi-weekly exercises. The solution of the problem sets is presented. Also use the exercise classes to discuss further problems closely related to the lecture. The tutorial session will take place on Fridays from 9 to 11. However, due to a public holiday on Friday, May 1, the first tutorial will be held on Monday, May 4, from 9-11. Both, the lecture and the tutorial session will take place live via Zoom (`https://hu-berlin.zoom.us`).

2 Please register for the course `https://moodle.hu-berlin.de/course/view.php?id=94431` The problem sets can be downloaded from Moodle. They shall be solved independently and will be discussed in the exercise classes. Successful participation in the lectures is the condition to obtain the ECTS points for this class. Therefore, the homework shall be handed in via Moodle. We prefer pdf files but photos of handwritten documents are also accepted. To obtain these ECTS points, at least 50% of the problems excluding voluntary problems (marked with *) must be solved with serious effort and independently.

3 Parts of the problem sets have to be solved with the computer. As software we use Matlab. Matlab is installed on the computers in the computing lab ("Poolraum") of the physics building. Information including the access via internet can be found at `https://www.physik.hu-berlin.de/de/irz/pc-pool/pool-info`. There is a campus license for Matlab for students of the HU (`https://www.cms.hu-berlin.de/de/dl/systemservice/computeservice/server/softw/matlab_html`). Information material on Matlab can be found on the official web pages of the software. Most of the problems can be solved with GNU Octave which is available as open source software (`https://www.gnu.org/software/octave`). Furthermore, you are welcome to solve the problems with Python together with packages such as numpy and matplotlib.

4 **Note with regards to COVID-19 (Corona virus SARS-CoV-2):**

Due to the ongoing pandemic situation, since March 20, 2020, the HU Berlin operates in emergency mode. In particular, this means that the begin of lectures of the summer semester 2020 has been postponed to Monday, April 20, and and ordinary teaching (with physical presence) remains disallowed. Instead, the lecture and exercises of the Computational Photonics course will be conducted electronically in the form of synchronous video conferences. Therefore, when you have registered to the Moodle course of Computational Photonics, you will receive via Email invitations to the corresponding Zoom-meetings.

5 The course is not following a specific textbook. For orientation, we provide a (necessarily incomplete) list of textbooks. There are many more textbooks that deal with the various numerical methods in photonics.

1. K. Okamoto, Beam Propagation Method (chapter 7 of Fundamentals of Optical Waveguides), Elsevier Science & Technology, Amsterdam, 2006
2. B. Lee, Fourier modal method and its applications in computational nanophotonics CRC Press, Boca Raton, 2010
3. U. Inan and R. Marshall, Numerical Electrodynamics: The FDTD Method, Cambridge University Press, Cambridge, 2011