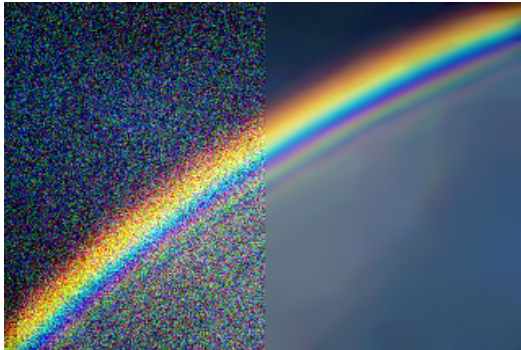


**Friday 9 July 2021 at 14:15**

Online (Zoom)



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## Carola-Bibiane Schönlieb

*(U Cambridge)*

### Mathematical imaging

Images are a rich source of beautiful mathematical formalism and analysis. Indeed, mathematics is the foundation for various image analysis tasks, including image denoising and deconvolution, image reconstruction from indirect measurements as they appear for instance in computed tomography, image segmentation and classification, just to name but a few. Associated mathematical problems arise in functional and non-smooth analysis, the theory and numerical analysis of partial differential equations, harmonic, stochastic and statistical analysis, and optimization and machine learning.

Starting with a discussion on the intrinsic structure of images and their mathematical representation, this talk will address some of these mathematical problems, including variational models for image analysis and their connection to partial differential equations and a new paradigm in mathematical imaging using deep neural networks. The talk is furnished with applications to art restoration, forest conservation and cancer research.

Carola-Bibiane Schönlieb is Professor of Applied Mathematics at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge. Her current research interests focus on variational methods, partial differential equations and machine learning for image analysis, image processing and inverse imaging problems. Her research has been acknowledged by scientific prizes, among them the LMS Whitehead Prize 2016, the Philip Leverhulme Prize in 2017, the Calderon Prize 2019, and a Royal Society Wolfson fellowship in 2020. Schönlieb received her PhD degree from the University of Cambridge in 2009. After one year of postdoctoral activity at the University of Göttingen, she became a Lecturer at Cambridge in 2010, promoted to Reader in 2015 and promoted to Professor in 2018. 