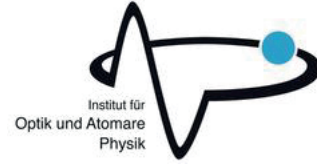
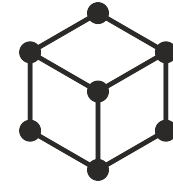


# Physikalisches Kolloquium



## Prof. Ingo Fischer

Instituto de Física Interdisciplinar y Sistemas Complejos, Palma de Mallorca

### “Neuro-inspired photonic information processing: the return of optics in computing”

We are currently witnessing a revolution in computing. The increasing demands on information processing have inspired new computational approaches, among them quantum computing and neuro-inspired or complex systems-based information processing techniques. These approaches offer new fascinating opportunities and reawakened also the interest in the role of optics for computing purposes. Here, we discuss, based on a minimal design approach, how hardware- and energy-efficient photonic implementations of the neuro-inspired computational concepts of reservoir computing can be achieved. We employ simple architectures based on semiconductor lasers and demonstrate that they can tackle computationally hard tasks at competitive data rates. As a particular application, we show the potential of reservoir computing to serve as a fast post-processing tool for improving the detection performance of critically degraded signals after fiber transmission. We will address the requirements and conditions that allow optical systems to process information efficiently, and discuss extensions of the architecture.

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**Thursday, 24.05.18 · 16:15h · EW 202**

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