



Berliner Physikalisches Kolloquium

im Magnus-Haus, Am Kupfergraben 7, 10117 Berlin

Eine gemeinsame Veranstaltung der Physikalischen Gesellschaft zu Berlin e.V. (PGzB), der Freien Universität Berlin (FUB), der Humboldt-Universität zu Berlin (HUB), der Technischen Universität Berlin (TUB) und der Universität Potsdam (UP), gefördert durch die Wilhelm und Else Heraeus-Stiftung.

Am Donnerstag, dem **05. Juni 2014**, um **18:30 Uhr**

spricht

Prof. Dr. Robert W. Boyd

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über das Thema

„Quantum nonlinear optics: Nonlinear optics meets the quantum world“

Moderation: Ulrike Woggon (TU Berlin)

Nonlinear optics is the key enabling technology for the blossoming field of quantum information science. The nonlinear optical processes of parametric down conversion and squeezed light generation are dominant processes in many quantum information protocols. From a different perspective, nonlinear optical effects such as self-action effects can modify the quantum statistics of light fields, leading either to advantageous or detrimental effects to various quantum protocols. Within this presentation, we illustrate these points through use of several examples.

Image formation making use of quantum states of light allows for dramatic new possibilities in the field of image science. As another example, we are currently developing a system to perform quantum key distribution at a high transmission rate by exploiting the transverse degree of freedom of the photon. We have also demonstrated that security protocols related to that of the BB84 protocol of quantum key distribution can be used to perform secure surveillance, that is, to ensure that image information in a scene of view has not been compromised. The final topic to be described is work aimed at the direct measurement of the quantum wavefunction.