# Memorial Symposium Herbert Walther (SYHW)

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## Übersicht der Hauptvorträge und Fachsitzungen

(Hörsaal 6J)

### Hauptvorträge

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| SYHW 1.2 | Do | 20:15–20:45 | 6J | **"Ist spontane Emission reversibel?"** — •Gerd Leuchs |
| SYHW 1.3 | Do | 20:45–21:15 | 6J | **Spontaneous Emission from an Extended Ensemble of $N$ Atoms: Single Photon Dicke States** — •Marlan Scully |
| SYHW 1.4 | Do | 21:15–21:45 | 6J | **Emission, Absorption and Scattering of Light by a Group of Atoms** — •Roy Glauber |

### Fachsitzungen

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| SYHW 1.1–1.4 | Do | 20:00–21:45 | 6J | **Memorial Symposium Herbert Walther** |

# SYHW 1: Memorial Symposium Herbert Walther

Zeit: Donnerstag 20:00–21:45 Raum: 6J

SYHW 1.1 Do 20:00 6J

**A Tribute to Professor Herbert Walther** — •Theodor W. Hänsch — Max-Planck-Institut für Quantenoptik, Garching — Department of Physics, Ludwig Maximilians-University, Munich

As a visionary scientist with stellar achievements and as an academic statesman of legendary power and energy, Prof. Dr. Dr. hc. Herbert Walther has shaped laser science and quantum optics in Germany and around the world in profound ways.

**Hauptvortrag** SYHW 1.2 Do 20:15 6J

**"Ist spontane Emission reversibel?"** — •Gerd Leuchs — Institute of Optics, Information and Photonics, University Erlangen-Nürnberg, Günther-Scharowsky-Strasse 1, D-91058 Erlangen, Germany

Die spontane Emission eines einzelnen angeregten Atoms im freien Raum wird gewöhnlich als ein dissipativer Prozess betrachtet und wäre daher nicht umkehrbar. Andererseits aber sind die Maxwell-Gleichungen zeitumkehrinvariant und der unitäre Zeitentwicklungsoperator in der Quantentheorie ist ebenfalls invertierbar. Diese widersprüchlichen Aussagen und eine mögliche experimentelle Überprüfung werden diskutiert.

**Hauptvortrag** SYHW 1.3 Do 20:45 6J

**Spontaneous Emission from an Extended Ensemble of $N$ Atoms: Single Photon Dicke States** — •Marlan Scully — Max-Planck-Institut für Quantenoptik, Texas A&M University, and Princeton University

A collection of $N$ static atoms is fixed in a crystal at a low temperature and prepared by a pulse of incident radiation of wave vector $\vec{k}_0$ [1]. The $N$ atoms are well described by an entangled single photon Dicke-like state, in which each atom carries a characteristic phase factor $\exp(i\vec{k}_0\vec{r}_j)$ where $\vec{r}_j$ is the atomic position in the crystal. It is shown that a single photon absorbed by the N atoms will be followed by spontaneous emission with an enhanced or suppressed emission rate. Furthermore, phase matched emission is found when one photon is absorbed by $N$ atoms followed by two-photon down-conversion. Connections with coherent Mössbauer $\gamma$-ray scattering will be discussed.

[1] M.O. Scully, E.S. Fry, C.H.R. Ooi, and K. Wódkiewicz, PRL 96, 010501 (2006).

**Hauptvortrag** SYHW 1.4 Do 21:15 6J

**Emission, Absorption and Scattering of Light by a Group of Atoms** — •Roy Glauber — Department of Physics, Harvard University, Cambridge Massachusetts 02138, USA

Identical atoms that are not too far apart freely exchange their excitations. That phenomenon leads to a number of interesting behaviors characteristic of these elementary processes involving radiation.