Appl. Phys. B (2016) 122:283
DOI 10.1007/s00340-016-6554-1

Applied Physics B
Lasers and Optics

EDITORIAL

"Enlightening the World with the Laser"—Honoring T. W. Hänsch

As guest editors of the T. W. Hänsch special issue of *Applied Physics B*, we are delighted to introduce you to a series of articles authored in honor of Professor Theodor W. "Ted" Hänsch, by colleagues, co-workers and (former) students of his. The occasion is Ted's 75th birthday, but the issue celebrates some 50 years of cutting-edge research that he performed first at the University of Heidelberg in the late 1960s, then at Stanford University, and since 1986 at the Max Planck Institute of Quantum Optics in Garching and the Ludwig-Maximilian University of Munich. *Applied Physics B* is a natural venue for such a Festschrift, given that Ted is serving on its Editorial Board since 1983.

How Ted Hänsch has influenced the way we think about lasers, and how we use them, is truly remarkable. His 75th birthday marks a great occasion to pause and reflect on his achievements. Ted Hänsch's passion is precision measurements and the study of the hydrogen atom. Yet, even if the Nobel Prize came for the ingenious frequency comb, "precision" and "hydrogen" do not quite cover his approach to physics. More generally, Ted keeps teaching us how we can use laser light, sometimes for rather playful applications, sometimes for fundamental breakthroughs—and from time to time also for commercial devices. His unique way of doing physics, however, goes much further. In addition to leading the way with groundbreaking research on topics from precision laser spectroscopy to ultracold quantum gases, Ted has motivated an entire generation of physicists to pursue related goals. He has generated a lasting impact in several communities, not least thanks to the large number of alumni from his research group who have gone on to develop careers of their own, inspired by Ted's example.

The esteem in which Ted is held by colleagues, collaborators and friends from around the world is reflected in the large number of excellent articles in this volume. We are grateful to the many authors who contributed such interesting papers. As you browse this issue, you will find papers by outstanding scientists who are working in the broad, interdisciplinary field of atomic, molecular and optical physics. Most contributions highlight the influence of Ted's scientific activities, current and past. Exciting new findings regarding precision spectroscopy of atoms and molecules are reported, alongside intriguing contributions in the areas of opto-mechanics, ultracold atomic and molecular quantum gases and matter-wave optics, as well as works on the development and application of novel laser sources, including frequency combs. Other articles provide insightful perspectives and reviews dedicated to various aspects of quantum and optical sciences.

We hope you will join us in celebrating Ted's achievements and enjoy this collection of papers.

Congratulations on your 75th birthday, Ted! We look forward to many more ideas on how to explore the world with laser light.

Zurich and Garching, October 19, 2016.

Tilman Esslinger, Swiss Federal Institute of Technology, Switzerland.

Nathalie Picqué, Max Planck Institute of Quantum Optics, Germany.

Thomas Udem, Max Planck Institute of Quantum Optics, Germany.

This article is part of the topical collection "Enlightening the World with the Laser" - Honoring T. W. Hänsch guest edited by Tilman Esslinger, Nathalie Picqué, and Thomas Udem.