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Five minutes with...

Name Marc Vrakking

Affiliation Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy

Author of *Attosecond Molecular Dynamics*

Book publication date June 2018

ISBN 9781782629955

When did you first become interested in your field?
My interest in ultrafast dynamics, and eventually, attosecond science, was really triggered by a year that I spent in Ottawa. At the time, there was quite a unique mix of students and postdocs there, many of whom have gone on to highly successful careers, and the discussion climate was probably the best I have ever witnessed. People were talking about ideas all day, and I got a lot of inspiration there that I could capitalise on when I had the opportunity to establish my own research group.

What do you think the future looks like for attosecond science?
It looks extremely bright. Attosecond experiments are now being performed investigating electron dynamics in almost any form of matter that we can consider, including atoms, molecules and the condensed phase. Moreover, we can see that techniques originating within attosecond science are branching out in novel research directions. The clearest example of this is perhaps the increasingly widespread use of XUV/softX-ray transient absorption spectroscopy, which provides unique insights into electronic dynamics from the point-of-view of individual atoms within a sample.

In your opinion, what is the biggest unanswered question in chemistry?
For now, in attosecond science, we are – by necessity – forced to work on problems that are, from a chemistry point-of-view, relatively simple. We are still at the stage of developing our techniques and honing our skills. My hope is that the maturation of attosecond science and the various spin-offs that it has already triggered will help to contribute to the age-old question of better understanding structure-function relationships in chemistry. But we have a long way to go before we will be able to do that.

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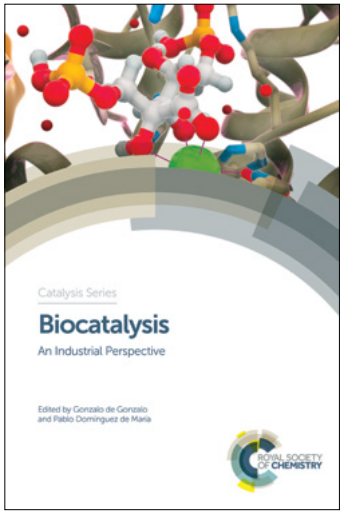

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Uwe Schneider University of Edinburgh, UK | **Stephen Thomas** University of Edinburgh, UK

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Alberto Villa Università degli Studi di Milano, Italy | **Nikolaos Dimitratos** Cardiff University, UK

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Luca Lietti Poltecnico di Milano, Italy | **Lidia Castoldi** Poltecnico di Milano, Italy

For the first time, this book provides a review of the current state of the technology in NOx traps. Covering both the fundamental and applied issues, the book features chapters from people within academia and industry. The book concludes with case studies demonstrating how these technologies are currently put into practice. This book is a fascinating reference for researchers and industrialists working in the treatment of exhaust fumes, as well as people in catalysis and in environmental monitoring.

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Carbides, Nitrides, Phosphides and Amorphous Boron Alloys

Justin Hargreaves University of Glasgow, UK | **Andrew McFarlane** University of Glasgow, UK |
Said Laassiri University of Glasgow, UK

Focussing on carbides, nitrides, phosphides and amorphous boron alloys, this book provides a comprehensive account of the preparation, characterisation and application catalytic materials. It is an important reference for researchers and industrialists working in heterogeneous catalysis and materials chemistry.

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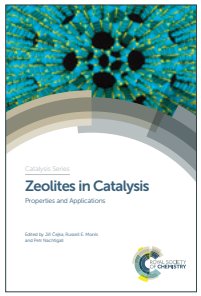

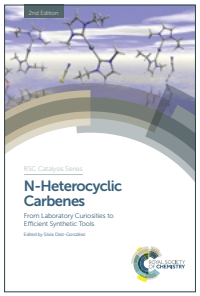

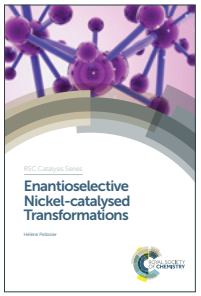

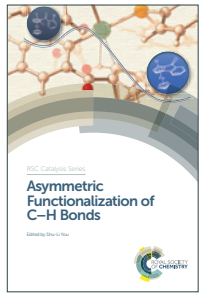

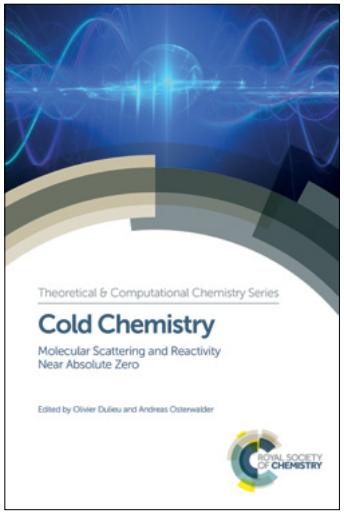

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Marc J J Vrakking Max Born Institute, Germany | **Franck Lepine** Université Lyon/ CNRS, France

Presenting an overview of theory behind attosecond science, this book explains and predicts manifestations of attosecond timescale dynamics in molecular systems. It is ideal for theoretical chemists wanting to better understand molecular dynamics at the ultrafast scale.

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Janos Angyan University of Lorraine, France | **John Dobson** Griffith University, Australia | **Georg Jansen** University of Duisburg-Essen, Germany

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The book covers the self-propelled motion of chemical objects far from their thermodynamic equilibrium at various spatial scales and its applications. The book will discuss theoretical aspects, the characteristics of the motion, and design procedures of such systems from the viewpoint of nonlinear dynamics. The book is suitable for graduate students and researchers interested in physical and theoretical chemistry as well as soft matter.

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