Atom-molecule coherence for ultralong-range Rydberg dimers

B. Butscher, J. Nöger, J. B. Salvestro, I. Kukuta, V. Boudařovský, R. Lüh and T. Pfau\textsuperscript{*}

\[ T \sim 3 \, \mu K \]

\[ T \sim 142 \, kHz \]

\[ \tau \sim 4.8 \mu s \]

\[ \tau = 3.2 \mu s \]

\[ \tau = 2.4 \mu s \]

\[ \tau = 1.6 \mu s \]

\[ \tau = 0.8 \mu s \]

reversible chemical reaction
Optical frequency comb: Ideal source for ultra-sensitive absorption spectroscopy
Four-dimensional photonic lattices and discrete tesseract solitons

Hrvoje Buljan
Department of Physics, University of Zagreb
Buljan@phy.hr
The story of neutron
"UR"-MINERALOGY

- Diamond/Lonsdaleite
- Graphite (C)
- Aloxinitite (SiC)
- Osbornite (TiN)
- Neutre (Si₃N₄)
- Rutile (TiO₂)
- Curvium (Al₂O₃)
- Zircons (Na₄SiO₄)
- Hübnerite (CaAl₂O₄)
- Foarvokyite (Mg₂SO₄)
- Nanoparticles TiC, ZrC, MoC, FeC, FeNi
- Metal in graphite
- GEMS (silicate glass with metal and sulfide inclusions)

All types of chemical bonds
Energy and matter at the origin of life

Nick Lane
Research Department of Genetics, Evolution and Environment
University College London
Exploring Parity Violation in Chiral Molecules

Martin Willeke
Department of Materials, ETH Zürich
and
Martin Quack, Phys. Chem. Lab., ETH Zürich
The possible roles of amphiphilic molecules for the origin of life

Peter Walde
Department of Materials, ETH Zurich, Switzerland
Proposed active roles of amphiphilic molecules

- Formation of Earth
- Stable hydrosphere
- Prebiotic chemistry
- Pre-RNA world
- RNA world
- First DNA/protein life
- Diversification of life

x 10^9 years ago

Hypothesis about the hypothetical precursors of the first cells

**The Origins of Life**

- Importance of physico-chemical processes
- Not yet biophysical!

**First Life**

- Discovering the Connections between Small Cells and How Life Began
- David Deamer

