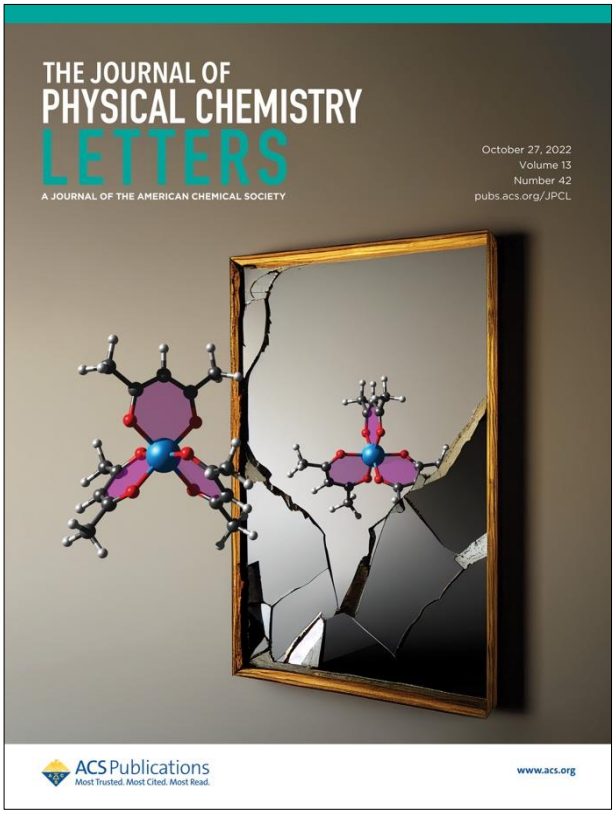
Journal Cover Pages



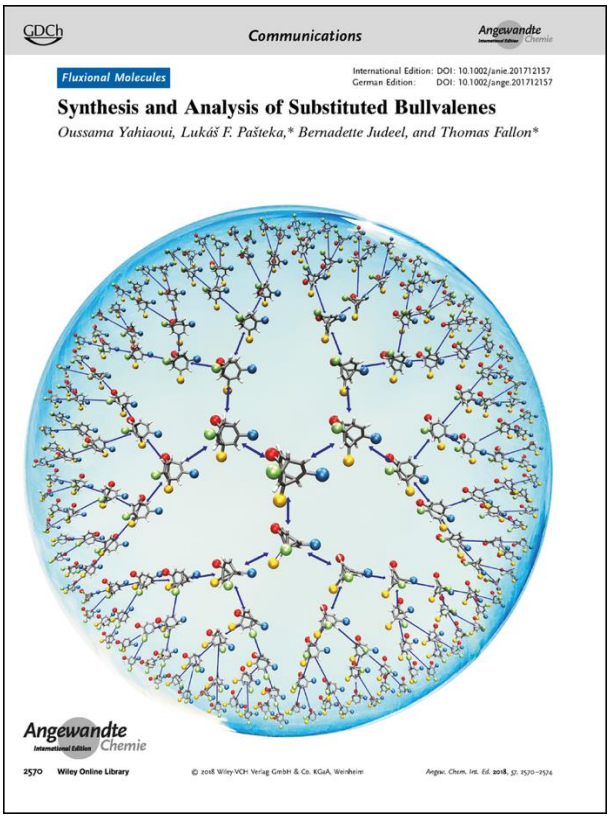
The broken mirror, into which the chiral organometallic complex peers, represents breaking of the mirror symmetry between enantiomers of chiral molecules due to weak electron-nucleon interactions.

Toward Detection of the Molecular Parity Violation in Chiral Ru(acac)$_3$ and Os(acac)$_3$
The Journal of Physical Chemistry Letters 13, 10011 (2022)
DOI: 10.1021/acs.jpclett.2c02434



The graphic design is a simple play on words “molecular photoswitch” illustrating them in a rather literal way. It is a visual representation of what this expression can evoke in peoples’ minds.

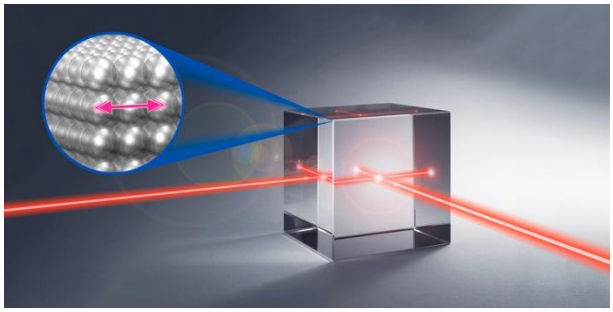
Enhancing the Potential of Fused Heterocycle-Based Triarylhydrazone Photoswitches
Chemistry - A European Journal 30, e202303509 (2024)
DOI: 10.1002/chem.202303509



Bullvalene ($C_{10}H_{10}$) is a molecular shapeshifter without a permanent structure constantly rearranging between thousands of isomers. This graphic is a schematic representation of a section of its vast rearrangement network with substituents ”floating” on top of the central carbon cage.

Synthesis and Analysis of Substituted Bullvalenes
Angewandte Chemie IE 57, 2570 (2018)
DOI: 10.1002/anie.201712157

Smaller Graphics



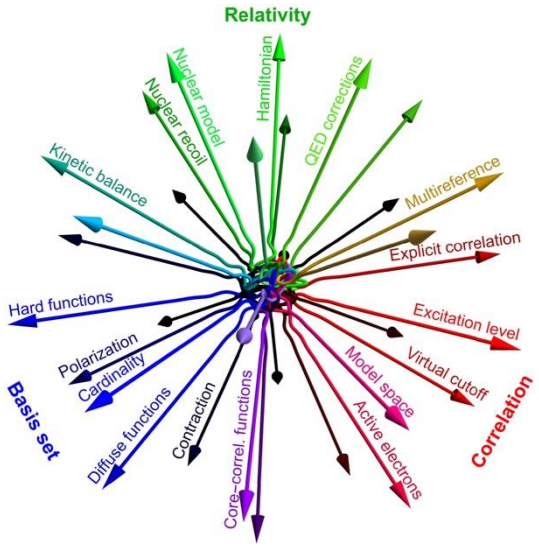
Small changes in fundamental constants may induce changes in the crystal structure of solids. Laser interferometry could serve as a new detection scheme for this effect.

Material Size Dependence on Fundamental Constants
Physical Review Letters 122, 160801 (2019)
DOI: 10.1103/PhysRevLett.122.160801



A different take on the disturbed mirror symmetry between chiral enantiomers. The ribbon arrows emphasize different helicities of the two enantiomers of helical metalocenes.

Parity violation effects in helical osmocene: Theoretical analysis and experimental prospects
The Journal of Chemical Physics 164 (2026)
DOI: 10.1063/5.0332812



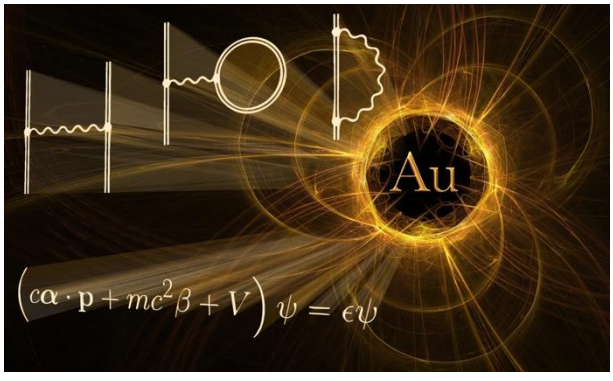
A representation of the multi-dimensionality of an electronic structure calculation and the gradual uncoupling of individual computational parameters.

Relativistic atomic structure calculations in support of spectroscopy
Progress in Particle and Nuclear Physics 146, 104200 (2026)
DOI: 10.1016/j.ppnp.2025.104200



A new photoswitching molecule exhibiting a rare solid-state ESIPT photochromism switching between red and yellow forms.

Solid-State Photoswitching of Hydrazones Based on Excited-State Intramolecular Proton Transfer
Journal of the American Chemical Society 147, 2421 (2025)
DOI: 10.1021/jacs.4c12510



Relativistic formalism (represented by the Dirac equation) and quantum-electrodynamic effects (represented by Feynman diagrams) played a crucial role in reuniting experiment with theory.

Relativistic Coupled Cluster Calculations with Variational Quantum Electrodynamics Resolve the Discrepancy between Experiment and Theory Concerning the Electron Affinity and Ionization Potential of Gold
Physical Review Letters 118, 23002 (2017)
DOI: 10.1103/PhysRevLett.118.023002

Conference and Institutional Logos

ICQC 2021

ICQC 2023

International Congress of Quantum Chemistry

ICQC 2021 – Being involved in the organization of the 17th ICQC held in Bratislava, I designed the logo for this event. The design is based on symmetry, a pivotal concept for the field of quantum chemistry.

ICQC 2023 – After being postponed due to COVID, the logo was redesigned instead to feature waves instead of symmetry while keeping the original color scheme. The meaning of the waves was dual, referring to the electronic wavefunction as well as the river Danube passing by the congress venue.

Van Swinderen Institute

During my research stay at Van Swinderen Institute for Particle Physics and Gravity (VSI) at the University of Groningen, a competition was held for the design of the institute mug to be used by members and visitors. My entry was selected.

Each letter of the logo represents one of the 3 frontiers making up the institute:

V – **High-energy frontier** = particle physics
ggF diagram featured in hadron collisions
S – **Cosmic frontier** = cosmology
gravitational waves emitted by a BH merger
I – **Precision frontier** = atomic/molecular spectroscopy
spinning particle exhibiting a vector moment

Furthermore, having multiple color variations left room for personal choice and partially avoids mix-ups at meetings.



LAM Laboratory for Advanced Materials

Laboratory for Advanced Materials

Established in 2018 under European Comission's Horizon ERA Chairs program, Laboratory for Advanced Materials (LAM) formed a new institute within the Comenius University hierarchy. As a project manager of LAM, I designed its logo referring symbolically to the laser waveform and wavelength (lambda).