Special Issue

Application of (Ultra-) High-Precision Laser Spectroscopy

Message from the Guest Editors

The technology of (ultra-) high-precision laser spectroscopy is revolutionizing analytical capabilities across scientific and industrial domains, enabling the development of unprecedented sensitivity, selectivity, and spatiotemporal resolution. Recent advances in laser sources, detector design, and computational methods have pushed detection limits to parts-per-trillion levels, unlocked real-time multi-component analysis, and facilitated miniaturization for field-deployable instrumentation. Topics of interest include the following areas: **Advanced Techniques**: developments in tunable diode laser absorption spectroscopy, cavity-enhanced methods, photoacoustic spectroscopy, and surface-enhanced Raman spectroscopy for trace detection.
Cross-Disciplinary Applications:

- Environmental Monitoring
- Medical Diagnostics
- Industrial Safety and Security

Enabling Technologies: AI-driven noise suppression, terahertz time-domain spectroscopy for ultrafast material dynamics, and engineered substrates for SERS hotspot optimization. **Fundamental Advances**: The mitigation of spectral broadening effects and novel materials for enhanced light-matter interactions.

Guest Editors

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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