# Special Issue

## Quantum Cascade Laser: Physics, Technology and Applications

### Message from the Guest Editor

The quantum cascade laser (QCL) is a unipolar quantum device fully based on a semiconductor technology platform. Its invention was marked as one of the top photonic breakthroughs since the establishment of quantum mechanics theory and brought with it hope and expectations. Although QCL has undergone surprising development in physics, technology, and applications in the past 27 years, there are still some vital issues that have not found solutions, e.g., room temperature QCL with direct terahertz gain has yet to be realized; little progress has been achieved for years on the overall efficiency of QCL; many technological challenges in the long-wave infrared range still need to be overcome; the nature of pulse generation and the limiting factors for obtaining shorter pulse widths and higher peak power in QCL need to be further explored; the application of mid-infrared and terahertz waves is far below our expectation, etc. This junction is a good time for us to conclude our past achievements, present our recent outcomes, and discuss the future prospects of QCLs.

### Guest Editor

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### Deadline for manuscript submissions

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