

Virtual Issue on Strong Field Chemistry

A laser field with intensity greater than 10^{13} W/cm² interacts strongly with the electrons in atoms and molecules. This interaction results in interesting and significant physical processes such as above-threshold ionization, above-threshold dissociation, and attosecond pulse production through high harmonic generation. While the fundamentals of strong field ionization of atoms remain active research subjects, the study of molecules in strong fields has already attracted much attention because of the added complexity of molecular degrees of freedom and multidimensional potential energy surfaces. Such studies reveal new dimensions of strong field dynamics and potentially offer new approaches for controlling chemical reactions not afforded by traditional perturbative methods.

The recent symposium on Strong Field Chemistry at the 256th ACS meeting in Boston brought together scientists who are actively working on the frontiers of strong field chemistry. The symposium hosted 25 invited speakers, including both experimentalists and theoreticians. Also notably, because of the nature of strong field related research, the symposium brought together researchers from both the physics and chemistry communities. The symposium provided an outstanding platform for communication between researchers in the field and an excellent educational opportunity for students.

This *Virtual Issue* collects recent publications by the speakers in the *Journal of Physical Chemistry*. The topics include molecular alignment/orientation, light-induced conical intersections, charge migration, coherent control, double ionization dynamics, and many others. It is clear that we have made tremendous progress in understanding the extremely complex processes involving multiple photons and many electrons. However, many issues remain unsolved, such as the role of electron correlation and the coupling and coherence among electronic and nuclear degrees of freedom.

We thank *The Journal of Physical Chemistry A* and *The Journal of Physical Chemistry Letters* for publishing this Virtual Issue. Our special thanks go to Prof. Amy Mullin and Prof. Anne McCoy for initiating the project. Physical chemistry journals are an excellent venue for research on strong field chemistry. The study of molecules in strong fields explores a new dynamical regime that is becoming ever more relevant. As the systems of interest become more complex, physical chemists are well-poised to make important contributions using strong field tools or those derived from strong field–matter interactions.

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Notes

Views expressed in this editorial are those of the authors and not necessarily the views of the ACS.

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■ ASSOCIATED CONTENT

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