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Abstract for an Invited Paper
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Order Out of Chaos: How Molecules Can Organize Themselves

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Advances in our understanding of nonequilibrium thermodynamics and nonlinear dynamics are helping us understand biological organization. In this seminar, the history of vitalism, objections to self-organization in non-biological systems and the amazing behavior of many simple chemical systems will be explored. Demonstrations of oscillating reactions and traveling fronts will be presented. We will explore how oscillating reactions were discovered and how the pioneering work of Ilya Prigogine corrected many chemists' understanding of the Second Law of Thermodynamics. We will explore how amazing spatial patterns can spontaneously arise in a Petri dish with standard lab chemicals. We will finally consider how the study of such self-organization is also of practical use to polymer science and present a new product based on a