

<b>Proposal Acronym</b>	ModelMatSigma
<b>Proposal Title:</b>	Modeling Ionic Conductivity in Materials - Glasses, Ionic Liquids and Ionogels
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<b>Research area:</b>	Chemistry CHE
<b>Sub-discipline of research area:</b>	Physical Chemistry; Solid State Materials; Ionic Liquids; New materials
<b>Category of research:</b>	basic
<b>Keywords:</b>	glassy ion conductors; ionic conductivity; permittivity; mixed former effect; jump relaxation; dipole field; cage length; localized diffusion; modeling; MIGRATION concept; ionic liquids; ionogels
<b>Abstract:</b>	<p>Study of ionic conductivity today encompasses not only traditional crystalline fast ion conductors but also various types of structurally disordered materials such as glasses, ionic melts, polymer electrolytes and ionic liquids - both simple and confined in supramolecular networks. Amongst various models that were developed in the past three decades, the model MIGRATION Concept based on jump-relaxation of ions has proved to be the most versatile one in modeling conductivity spectra - extracting length and time scales relevant to ion dynamics in systems under study. In the current project, I propose to use MIGRATION Concept to model ionic conductivities and permittivities in mixed network former glasses, ionic liquids and ionogels. Results such as cage length and typical time scales of localized diffusion will help engineer ion conducting materials for better device applications. This project also aims at knowledge transfer and development of an open-resource software of the model.</p>
<b>Does this proposal possess any of the sensitive ethical issues detailed in ethical issues table?:</b>	No