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Abstract for an Invited Paper  
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**Laboratory Astrophysics Studies along the Cosmic Cycle of Gas<sup>1</sup>**

DANIEL WOLF SAVIN, Columbia University

Tracing the evolution of baryonic matter from atoms in space to stars such as our Sun hinges on an accurate understanding of the underlying physics controlling the properties of the gas at every step along this pathway. Here I will explain some of the key epochs in this cosmic cycle of gas and highlight our laboratory studies into the underlying atomic, molecular, and optical physics which control the observed properties of the gas.

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