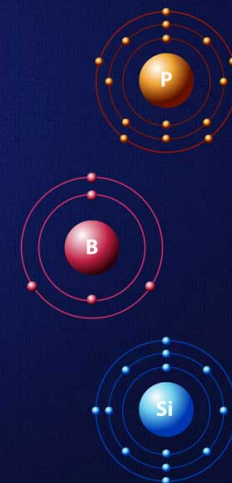


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## Catalytic, Metal-Mediated and Metal-Free Routes to Molecules and Materials based on Boron and other p-Block Elements

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Although metal-catalyzed reactions have played a profound role in organic synthesis, catalytic routes to main group molecules and materials are much less explored.<sup>1</sup> In this talk the use of catalytic processes to, for example, dehydrogenate group 13 – 15 Lewis acid-Lewis base adducts such as amine- and phosphine-boranes and related species will be discussed. In addition to mechanistic details, unexpected discoveries such as metal-free hydrogen exchange reactions will be described. The work has relevance to the synthesis of new polymeric (e.g. polyamino- and phosphinoboranes, analogs of polyolefins with a BN/BP backbone) and 2D materials and also to hydrogen storage and transfer chemistry.<sup>2-4</sup> The use of metal free “addition polymerization” routes to new BN/BP materials will also be outlined.<sup>5</sup>

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