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Structural Evolution in Ni-Zr Liquids and Glasses[1] COOPER SINAI-YUNKER, Lawrence Univ — Metallic alloys have been shown to possess a wide-range of glass-forming abilities (GFA). While multicomponent alloys tend to have higher GFA than simpler alloys, the underlying principles that govern GFA are relatively unknown. While the atomic arrangements in metallic glasses do not possess well-defined long-range atomic order that characterizes crystalline metals they do demonstrate short- (SRO) and medium-range (MRO) atomic order. Previous studies suggest a link between structural evolution and GFA. In this talk we discuss recent results on the temperature evolution of the atomic structures of Ni-Zr liquids and glasses using *in situ* high-energy synchrotron X-ray diffraction. Ni-Zr is an excellent system to explore due to its simplicity but also because it forms the basis for high GFA multicomponent alloys. By utilizing the beamline electrostatic levitation (BESL) technique, several compositions were prepared in both the equilibrium and supercooled state. Reverse Monte Carlo (RMC) fits were conducted whereby 3-D atomic configurations consistent with experimental data were be generated and subsequently analyzed. The fits were constrained by partial pair-correlation functions generated from *ab initio* molecular dynamics simulations. Quantitative results will be discussed which suggest that Ni-Zr has a high degree of MRO, chemical ordering and is a highly *fragile* system.

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