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A machine learning approach for the classification of metallic glasses ERIC GOSSETT, ERIC PERIM, CORMAC TOHER, Mech. Eng. Mat. Sci., Duke University, DONGWOO LEE, HAITAO ZHANG, Eng. Appl. Sci., Harvard University, JINGBEI LIU, SHAOFAN ZHAO, JAN SCHROERS, Mech. Eng. Mat. Sci., Yale University, JOOST VLASSAK, Eng. Appl. Sci., Harvard University, STEFANO CURTAROLO, Mat. Sci., Elec. Eng., Phy. Chem., Duke University — Metallic glasses possess an extensive set of mechanical properties along with plastic-like processability [1]. As a result, they are a promising material in many industrial applications [2]. However, the successful synthesis of novel metallic glasses requires trial and error, costing both time and resources. Therefore, we propose a high-throughput approach that combines an extensive set of experimental measurements with advanced machine learning techniques. This allows us to classify metallic glasses and predict the full phase diagrams for a given alloy system. Thus this method provides a means to identify potential glass-formers and opens up the possibility for accelerating and reducing the cost of the design of new metallic glasses. [1] J. Schroers, N. Paton, Amorphous metal alloys form like plastics. Adv. Mater. Processes 164(1), 61-63 (2006) [2] W. L. Johnson, Bulk glass-forming metallic alloys: science and technology. MRS Bull. 24, 4256 (1999)

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