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Presentation of the Dana Medal of the Mineralogical Society of America for 2013 to Max W. Schmidt

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Dear Members,

I am very pleased that Max Schmidt of the ETH tonight receives the Dana Medal of the MSA, because Max and his achievements exemplify effective science. That Max should be honored by the mineralogical community is beyond doubt when one considers his accomplishments. Let me highlight three of them:

Experiment innovation, vision, and achievement. Max has been an absolute visionary in his ability to *imagine* new experimental techniques. More importantly, his expertise, focus, and insight have enabled him to *turn these visions into reality*. Few people have both vision *and* execution in this degree. Max's development of a rocking multi-anvil *and* piston cylinder press is a mind-boggling technological leap: I don't know how Max thought of it, much less had the time and energy to implement it, but they now define the cutting edge of research because of all the new kinds of experiments they enable. And *yet*, soon after, Max's technological wizardry produced a centrifugal high-pressure apparatus that can achieve 3000 g's, allowing efficient phase separation and breaking yet *another* experimental barrier: *time*. For *one* person to have made two major cutting-edge innovations is frankly amazing. *Each* of these breakthroughs by itself is worthy of a medal, and the Dana Medal is certainly the most appropriate because of their impact on mineralogy.

Experimental phase relations. Max has conducted or directed *much* of what constitutes 21st century experimental petrology of Earth materials, producing the *definitive* experiments on a host of rocks, and on a range of minerals. Most of Max's data were published in *American Mineralogist* and each is an impressive contribution. While looking over Max's CV I realized that I have read nearly all of his experimental papers, and they are the first place I turn for the phase relationships in subduction zones. The papers are so broadly relevant and authoritative that it is *impossible* not to know them *in detail*; to do so would be to miss out on the frontier of science. As one example: I recently assessed how well activity models for crustal melts replicate reality; for this I needed phase compositions and abundances from experiments on crustal rocks…the *bulk* of the data were generated in Max's lab.

Application to Earth and the solar system. While easy to rave about Max's experimental accomplishments because they are so grand, it is his application of these data to the Earth and the solar system that are the most visible. These contributions include the definitive papers on the phase relations of subducting crust, devolatilization in subduction zones, trace-element partitioning in melts, decompression melting during exhumation of UHP rocks, melt viscosity, core formation, melt percolation and extraction, arc magmatism, deep-crustal foundering, and UHT metamorphism. An impressive list! At every scientific presentation on subduction zones or arcs, the iconic Schmidt and Poli diagram of devolatilization makes its obligatory appearance to set the stage for the data and interpretation that will follow.

Max's work is described by his supporters as "an extremely innovative and spectacular succession of *tours de force,* driving advances within and beyond the discipline, producing sustained and original scholarship that is outstanding in every way." Finally, those best acquainted with Max emphasize his altruism in building the careers of those around him, putting his students first in the lab and first on publications.

In summary, Max Schmidt's existing work establishes him as an Earth science giant, deserving of the Dana Medal for his "sustained outstanding scientific contributions through original research in the mineralogical sciences." Fortunately Max is young enough that we can look forward to much more groundbreaking science in the years ahead.

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