American Mineralogist, Volume 110, page 658, 2025

Presentation of the Dana Medal of the Mineralogical Society of America for 2024 to Fabrizio Nestola

Graham Pearson[1,*]

[1]Earth and Atmospheric Sciences, University of Alberta, Edmonton, Alberta T6G 2E3, Canada

MSA Members:

It is my great pleasure, along with the support of my fellow nominators, Nancy Ross, Dan Frost, and Steve Jacobsen, to introduce Professor Fabrizio Nestola as MSA's 2024 Dana Medal winner. Fabrizio's contributions to mineralogical research have deeply impacted our understanding of a broad swathe of solid Earth processes, providing key insights that have changed our thinking. I will describe some of this research very briefly.

But first, I'd like to offer you a more personal taste of Fabrizio—or Fabri to his friends.

If you were to make a list of "keywords" to describe Fabri, they would include: "Dynamic, passionate, inspirational, tireless, sociable, and eccentric in a nice way!" "Force of nature" might be a good description.

Collaborating with Fabri is like getting caught up in a whirlwind! He has limitless enthusiasm and ideas, many of which seem to come to him in the middle of the night. It's like collaborating with a team of people, all at once from all around the world, because you can expect to receive emails at any time of day or night—heavily punctuated with his signature multiple exclamation marks—and whatever time you send a message, you can expect an instantaneous reply! He seems to require no sleep. Fabri's boundless energy can lead to interesting situations, such as being in an ultrahigh-security diamond sorting house with him, where rapid hand movements are forbidden, but his Italian nature gets the better of him, and we are almost ejected!

OK, now a little science. Early in his career, Fabrizio made major contributions to understanding geological processes occurring at high pressure and high temperature in Earth's mantle and crust via his studies in mineral physics. He determined the thermoelastic properties of important mantle minerals such as olivine, clino- and orthopyroxenes, amphiboles, garnets, spinels, antigorite, kyanite, and ringwoodite to define their thermodynamic stability fields and their structural response to extreme temperature and pressure conditions. Notably, these parameters were also characterized as a function of composition, allowing widespread practical use by the geological and geophysical community.

In addition, Fabri conducted ground-breaking studies of several in situ phase transformations as a function of pressure and temperature to understand how they affect seismic discontinuity depths and mantle density profiles.

One of the many amazing facts about Fabri's career is that, as one of the world's leading crystallographers, he has been centrally involved in discovering over 70 new minerals, and the list is still growing! This accomplishment would be enough for most scientists, but Fabri's passion is to use mineralogy and crystallography to unravel the deep Earth.

Some of Fabri's significant advances have come from studying diamonds and their inclusions. Since ~2011, his group has revolutionized diamond research through their detailed X-ray crystallography studies and the resulting development of the elastic barometry method, allowing important new revelations about the *P-T-t* history of diamond-inclusion pairs. I will leave it to Fabri to describe all this for you in his lecture more elegantly than I can here. This breakthrough, using diamond-inclusion pairs to extract their physical history, is a beautiful application of crystallography and mineral physics, and it is only one example I have time to cover!

A striking feature of working with Fabri is the amount of time he still spends in the laboratory, personally teaching students or making very demanding measurements. His co-authorship on most papers typically involves the contribution of critical data, as well as novel ideas and interpretations.

Those of us who work on diamonds would agree that Fabri's entry into the diamond research field has had a great catalyzing effect—through sheer force of personality. He has successfully brought together many separate research groups through the four very successful "International Diamond Schools" to promote a level of collaboration in the field that simply didn't happen before.

Fabrizio has an exemplary record of training and mentoring new researchers in the field of mineral sciences in a truly inclusive and supportive environment, as should all top-tier scientists.

His commitment to outreach is second to none. A prime example is his selection to lead the establishment of a new >30M Euro Museum at the University of Padua, the largest University-hosted Museum of Natural Sciences in Europe. In concert with that effort, he was elected Director of all 11 of the University of Padua Museums, a group that includes a UNESCO World Heritage botanical garden. This position is a reflection of Fabrizio's infectious enthusiasm to feed back the exciting results of research into society.

Fabri has achieved all this while remaining well-grounded in family life and being very proud of his Italian heritage.

For his exceptional and wide-ranging research contributions to mineralogy, crystallography, and mineral physics, together with their broad impact on understanding the solid Earth, my co-nominators and I present Professor Fabrizio Nestola as a worthy recipient of the Dana Medal.

* Corresponding author E-mail: graham.pearson@ualberta.ca

0003-004X/25/0004–658$05.00/DOI: https://doi.org/10.2138/am-2025-AP11044