A DAY IN THE LIFE OF TIMOTHY L. GROVE

"The Professor and Journal Editor"

PhD, Professor of Geology, Massachusetts Institute of Technology

Massachusetts Institute of Technology
Earth, Atmospheric and Planetary Sciences

Research Profile For Tim Grove:

- My first paper – 1973

Proceedings of the Fourth Lunar Science Conference
(Supplement 4, *Geochimica et Cosmochimica Acta*)
Vol. 1, pp. 995–1011

Petrology of rock 12002 and origin of picritic basalts at Oceanus Procellarum

TIMOTHY L. GROVE, DAVID WALKER, JOHN LONGHI,
EDWARD STOLPER, and JAMES F. HAYS

Hoffman Laboratory, Harvard University Cambridge, Mass. 02138

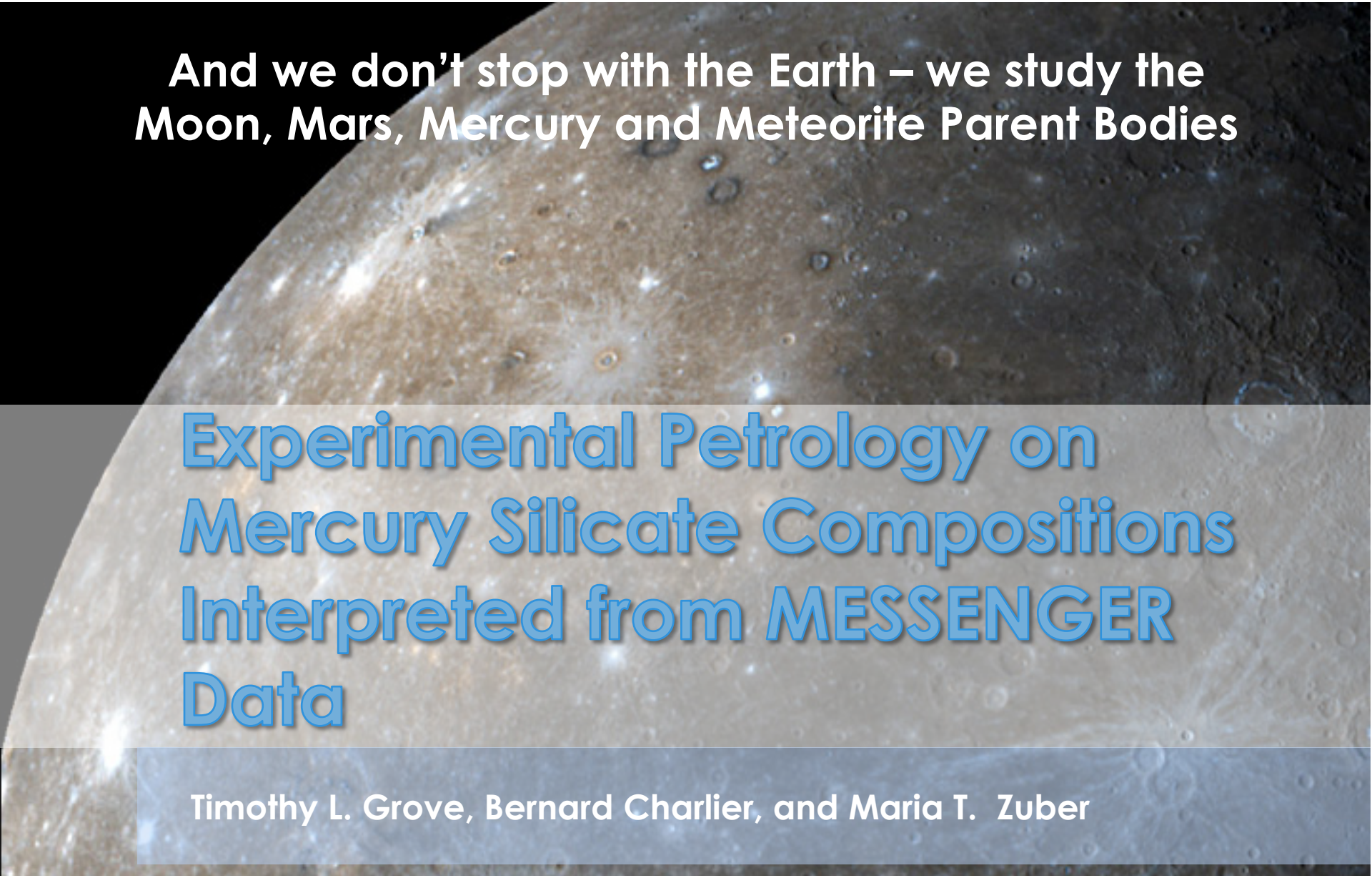
Abstract—Rock 12002 is a member of the Apollo 12 picritic basalt suite. Experimental olivine-liquid equilibria combined with petrographic observations indicate that 12002 may represent a primary liquid composition. As shown by high pressure experiments, liquids capable of producing the picritic suite can be generated by the partial melting of an olivine+clinopyroxene lunar interior at a depth of 300 km. The crystallization sequence inferred from petrographic observations has been reproduced experimentally at low pressures. Chemical variations similar to those in natural pyroxenes have been partially reproduced in equilibration experiments and suggest a two-stage cooling history for 12002.

- Professor at MIT – since 1979
- Currently - 176 published papers- 312 meeting presentations
- Mentoring -21 Ph.D. Students and 10 Post-docs
- Executive Editor: Contributions to Mineralogy and Petrology - Springer since 1990

How Have My Publishing Habits Changed Over Time?

- Started publishing in the early 1970's in the pre-digital age. Typewriters, hollerith cards, hand-drafted figures, index cards, hours in the library searching content.
- Many transitions have occurred over 39 years of researching, publishing and editing.
- Biggest Changes:
  - Citation tracking forward in time. Allows me to follow evolution of thinking in a research area.
  - Software that organizes content and facilitates manuscript preparation (e.g., End Note and Papers.)
  - On-line journal submission.
  - MITx and edX – online with embedded social networks

On Earth our research starts with field work – looking W from Medicine Lake volcano to Mt. Shasta, N. Calif.

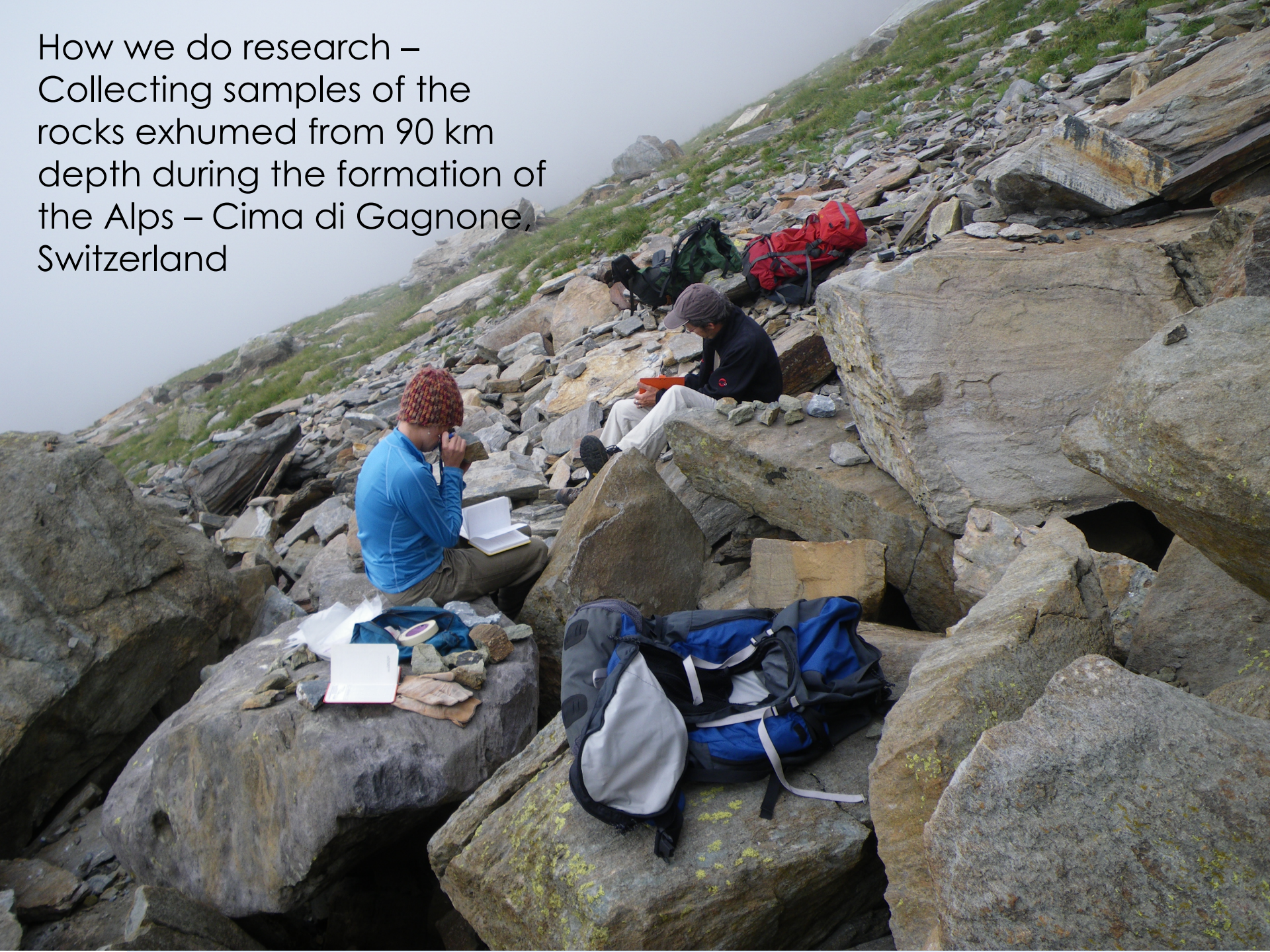


And we don't stop with the Earth – we study the Moon, Mars, Mercury and Meteorite Parent Bodies

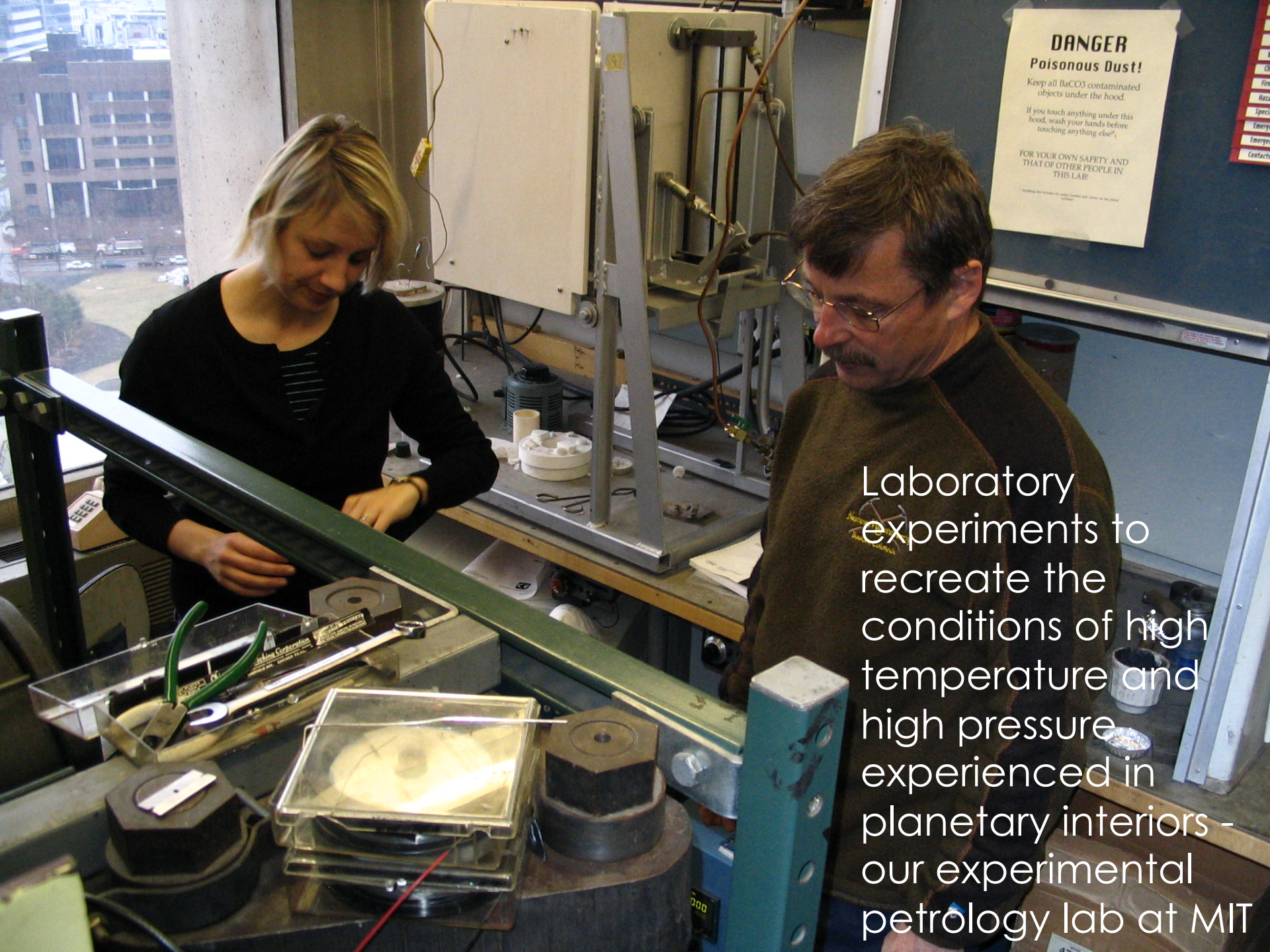
Experimental Petrology on Mercury Silicate Compositions Interpreted from MESSENGER Data

Timothy L. Grove, Bernard Charlier, and Maria T. Zuber

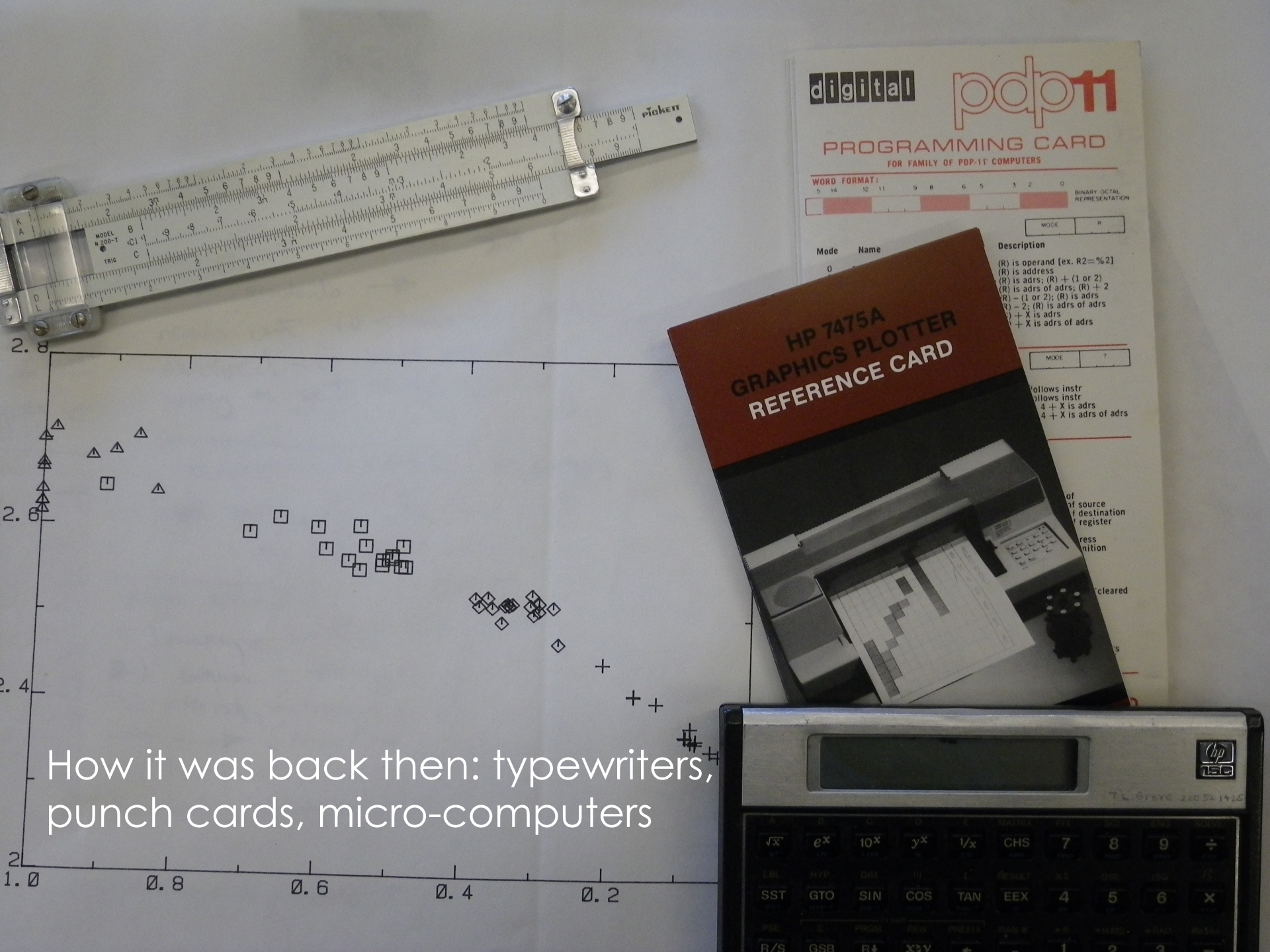
Massachusetts Institute of Technology
Earth, Atmospheric and Planetary Sciences


How we do research – Collecting samples of the rocks exhumed from 90 km depth during the formation of the Alps – Cima di Gagnone, Switzerland

Collecting samples for geochemistry/petrology from young volcanoes – Christy organizes two week's worth of sampling, N. Calif.



Laboratory experiments to recreate the conditions of high temperature and high pressure experienced in planetary interiors - our experimental petrology lab at MIT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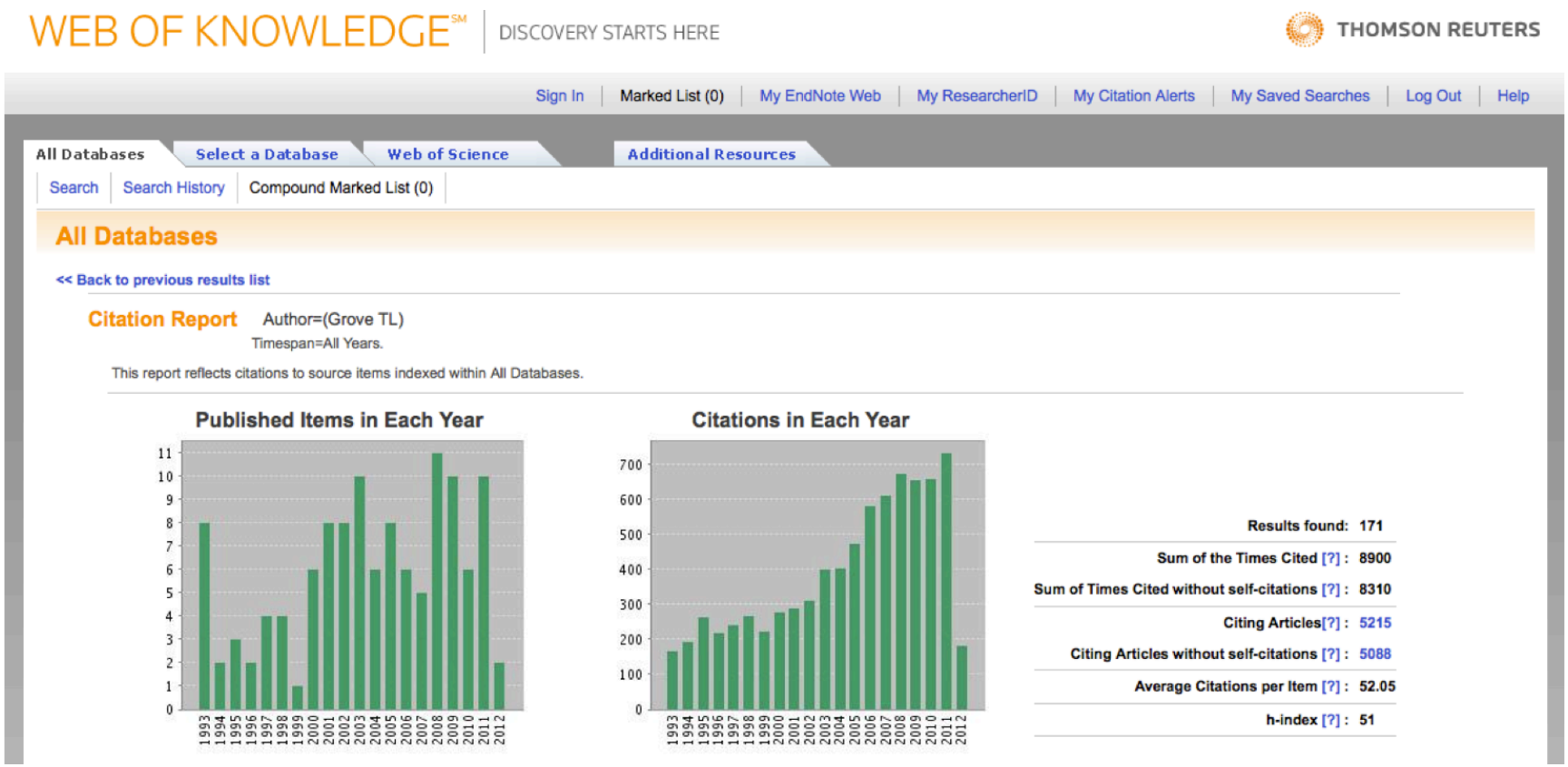
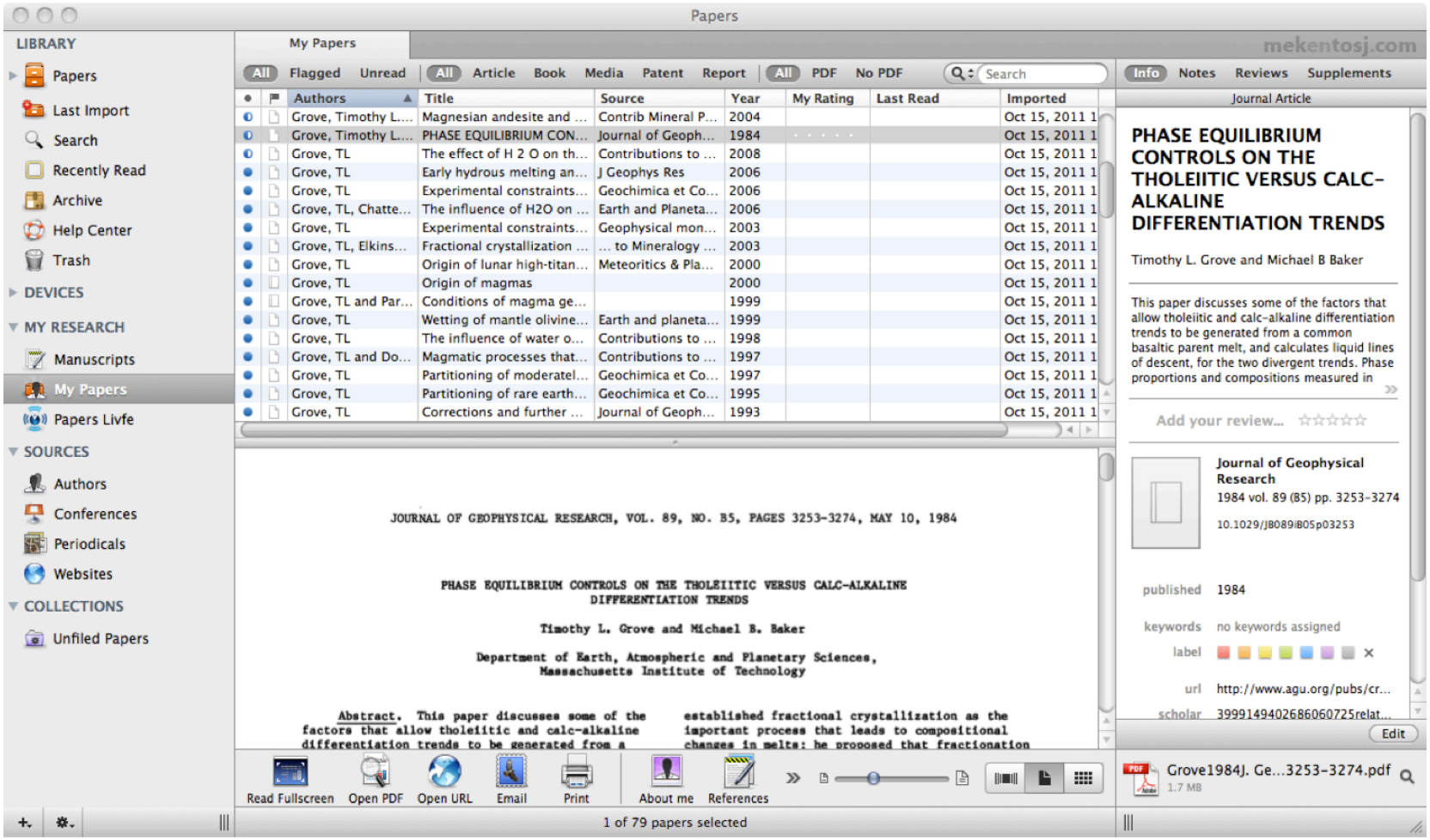
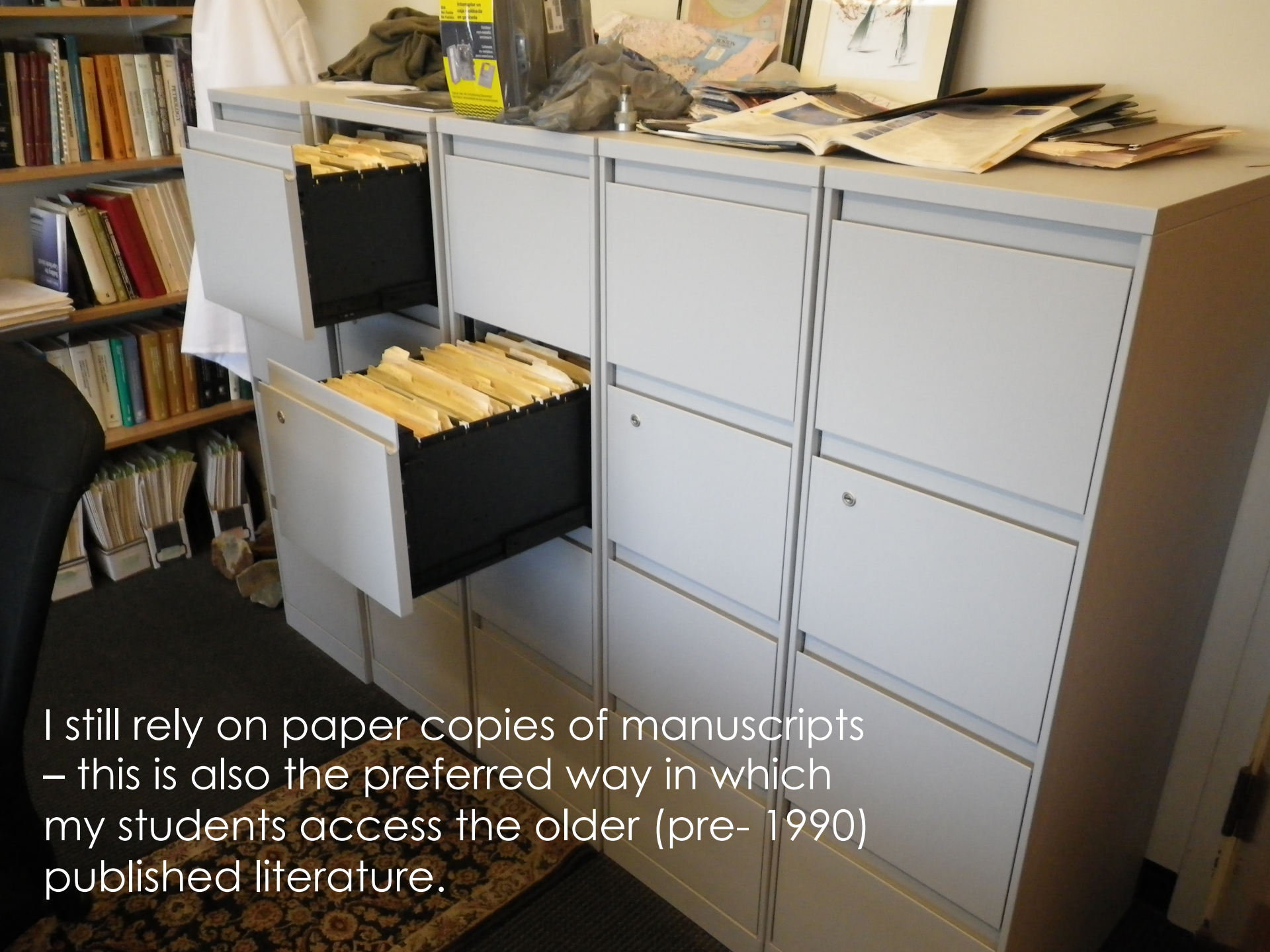
How it was back then: typewriters, punch cards, micro-computers

Accessibility to who has cited whom forward in time – has fundamentally changed the way I access published literature.





Software tools like **Papers, Mendeley** and **End Note** have allowed me to organize the literature in my research area and facilitate preparation of manuscripts. BUT…


I still rely on paper copies of manuscripts – this is also the preferred way in which my students access the older (pre- 1990) published literature.

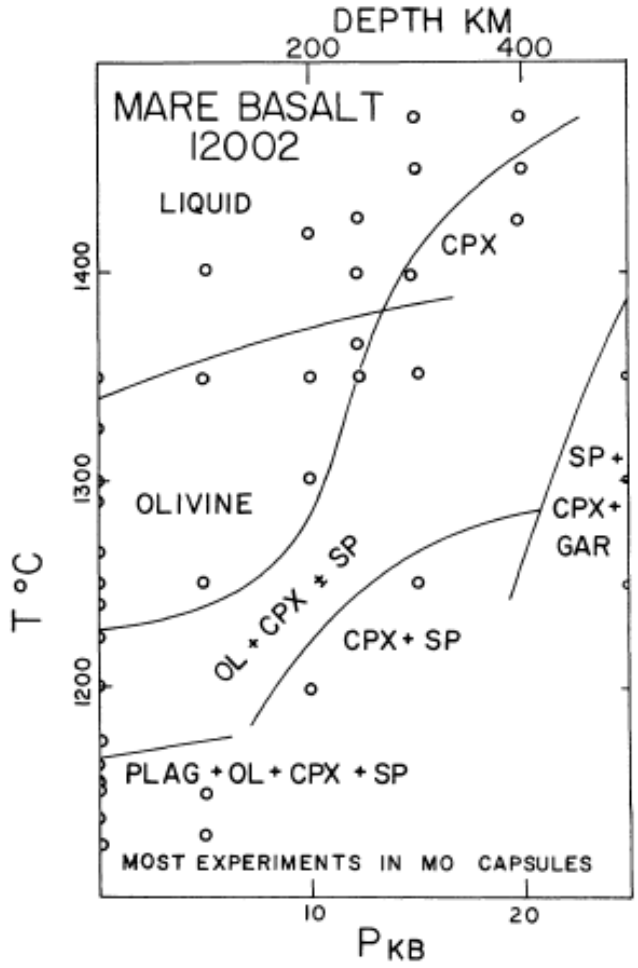


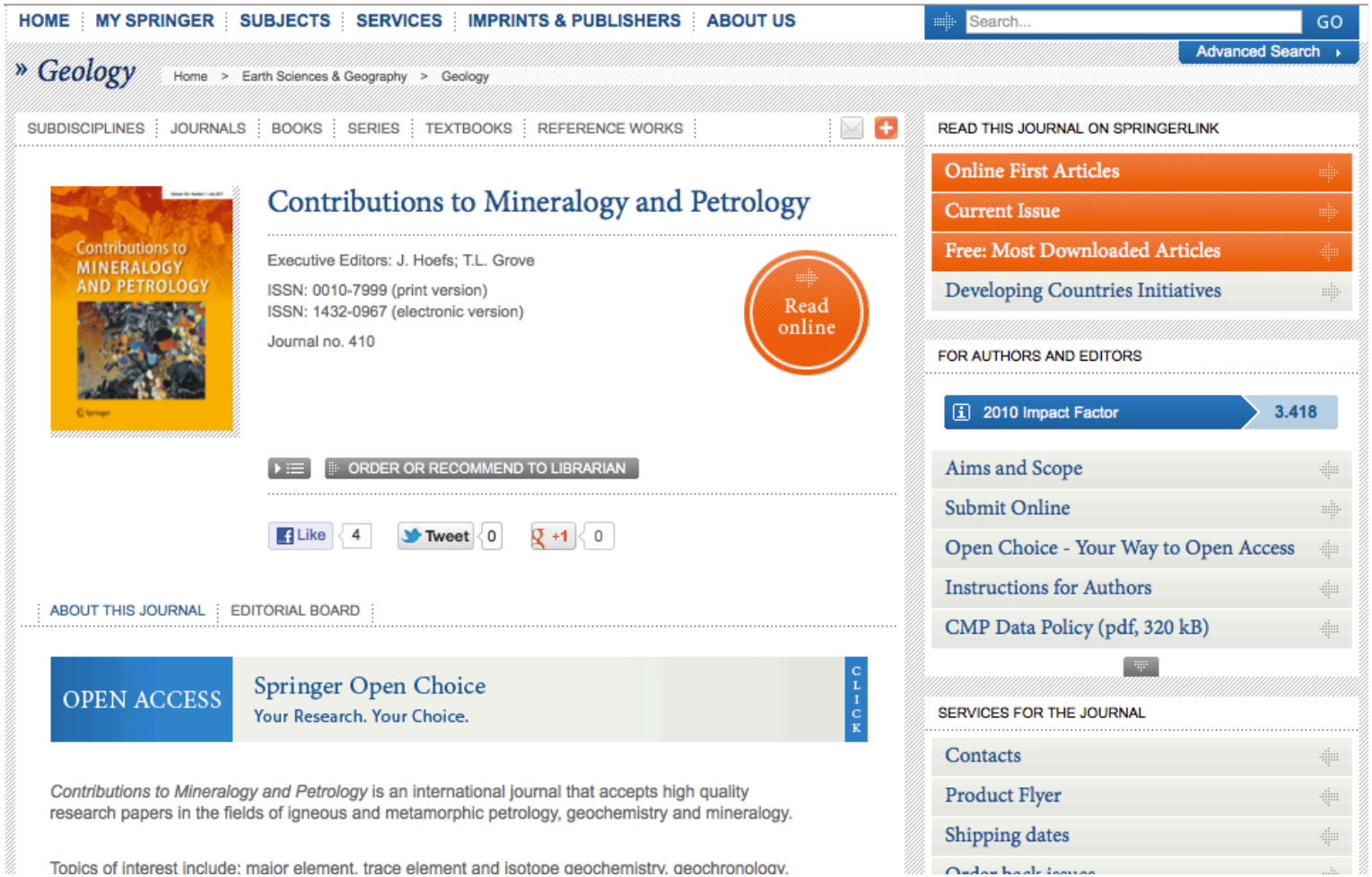
Fig. 4. Results of crystallization experiments on 12002 using devitrified glass starting material. Boundaries at 1 bar reversed; others are synthesis boundaries.

A figure from the Grove et al. 1973 paper – hand drafted using pen and india ink…..

And…. When this older literature is available on-line the quality of the reproduction is very poor.

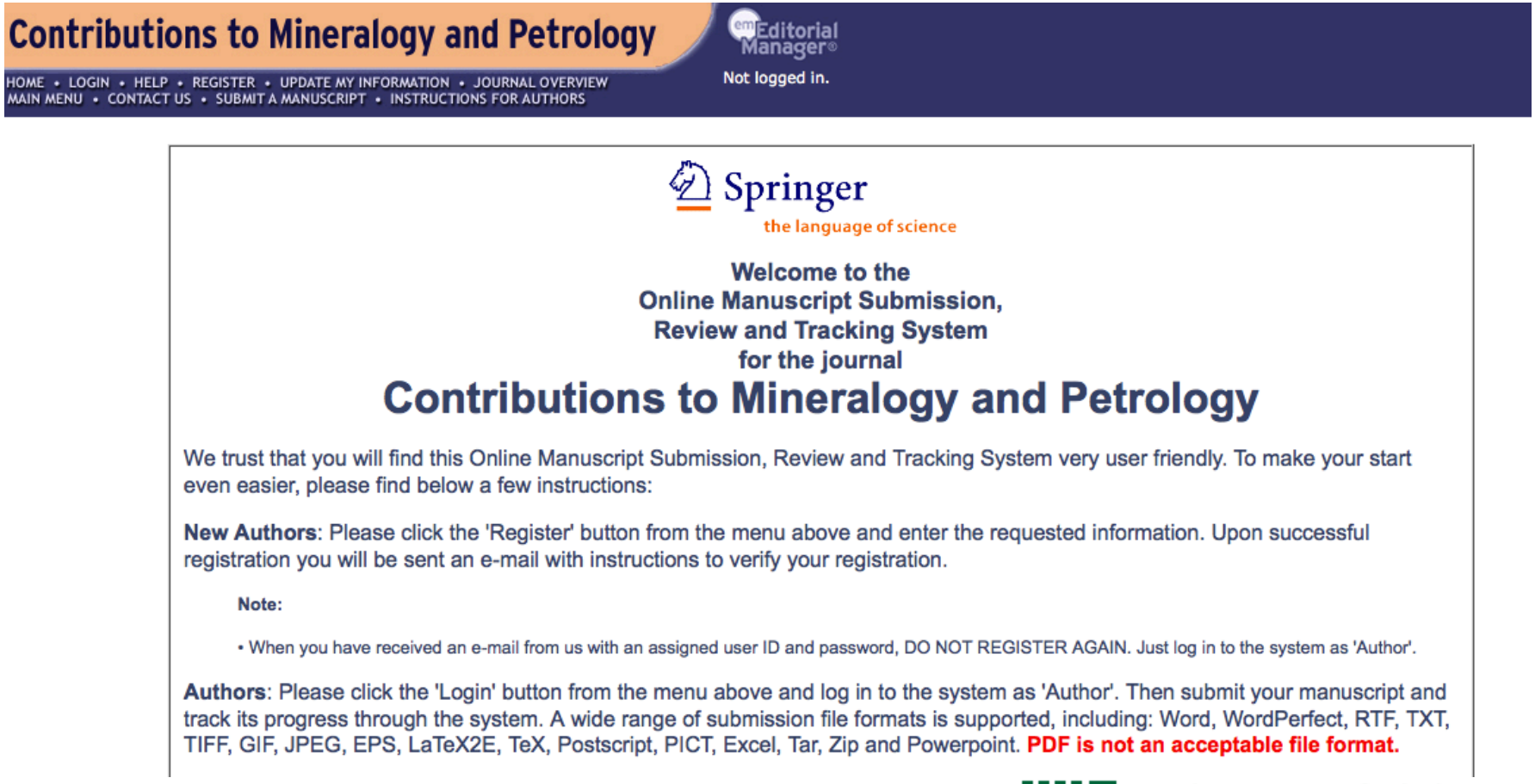
In some fields new missions like NASA's GRAIL benefit from Apollo-era data.

In fact, this is a problem with the current literature and the "download the pdf" approach that most people take in collecting their literature.



I have been Executive Editor for CMP since 1990 – biggest change here has been electronic submission

Electronic journal submission has dramatically changed my job as an Editor. Submission rates have gone up by a factor of 5 and my rejection rate has gone from 10 % to 50 %. **I am your low-cost validation provider.**



What would I like to see in the future of publishing?

- Move beyond the printed article & pdf (pdf is a step back) – New types of **interactions** with data in the published unit … real time comparisons with other data sets. This is one type of value-added activity with data that is unexploited,.
- More effective ways to access what has been done before – Important in fields where citation half life is > 10 yrs, but the older on-line literature is not available. And when it is the quality is poor. (pre-1990 for our field). e.g. Apollo era.
- Integration of data sets across the published literature - Archival, access and interaction. A publication still stands alone.