MRS: The Growth Phase

S. Tom Picraux

This contribution continues the MRS story, picking up from the early years, as described by Rustum Roy, and focusing on the period of rapid growth. My objective is to provide a brief summary of the history of the Materials Research Society up to the present time, as a part of our celebration of the 20th anniversary of MRS.

The first years of MRS can be referred to as the nucleation phase, as the principles of interdisciplinarity, focused symposia, and greater interaction among researchers became appreciated. The interactions which MRS fostered between disciplines, between basic and applied scientists and engineers, and among researchers at universities, industry, and government labs soon began to attract more and more colleagues to this new Society and its meetings (see plot of MRS membership, 1973–1993, in Figure 1).

The transition from the nucleation to the growth phase had its real beginnings in a number of highly successful symposia of the late 1970s, which attracted much excitement and many attendees. Perhaps two of the best examples are the symposia on Laser Annealing and The Scientific Basis of Nuclear Waste Management, both of which were first held in 1978. Both of these areas were truly "hot topics" and the MRS Meeting became *the place* to report one's latest results and to learn of new developments in these areas. Likewise, the proceedings of these symposia became the single best source for obtaining a perspective on these topics. These subjects served as excellent examples of the benefit of combining the perspectives of multiple disciplines, of fundamental and applied research, and of science and technology. For example, laser annealing led at the same time to fundamental aspects of liquid-solid phase transitions at speeds not previously considered, and to rapid thermal annealing for activating ion-implanted dopants in silicon, a process now routinely used in silicon-device manufacturing. As a result of such topical symposia's successes, the number of members between 1977 and 1979 jumped from approximately 300 to 1,000, with comparable numbers of attendees at the (then) "Annual" Meeting in Boston.

These events of the late 1970s set the stage for the truly impressive growth of the 1980s, as seen in the accompanying membership plot. Between 1983 and 1990, MRS membership increased from less than 1,600 to over 10,000 members, with typical growth rates of about 30% in the middle 1980s. Concurrent with this growth in membership, the number of symposia rapidly expanded from about a dozen in the early 1980s to cover all the letters of the alphabet, and a Spring Meeting in the western United States was added in 1984 to relieve pressure on the Boston Fall Meeting. During this period, many additional topics gained widespread attention at the meetings—thin films, implantation, defects, epitaxy, ceramics, plasma processing, catalysis, fractal-like materials, to name only a few. Also, rapidly breaking new developments in materials science, such as high-temperature superconductors and diamond films, led to still further additions to the topical coverage. All in all, the increase in membership largely paralleled the growth in the number of meeting attendees.

The growth phase can be viewed from other dimensions as well. A good overall sense of the events defining these different dimensions is gained from the accompanying time line of major MRS milestones (on pages 80–81). One major event which was necessitated by our growth and which formed the basis for many of the other things that followed was the establishment of a headquarters in Pittsburgh in 1983, with John Ballance as the newly established MRS executive director and first full-time employee.

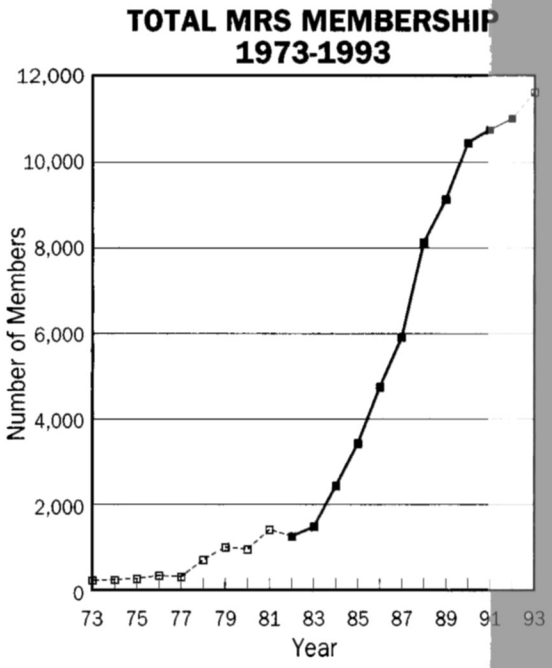
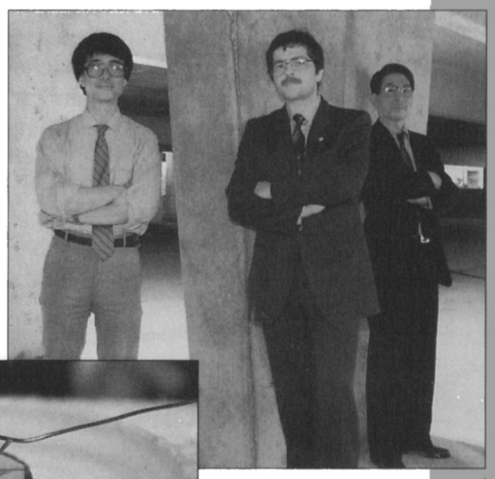


Figure 1. Growth of MRS membership. Open squares are approximate or estimated membership. Solid squares are end-of-year membership. The broken and solid line is to guide the eye.



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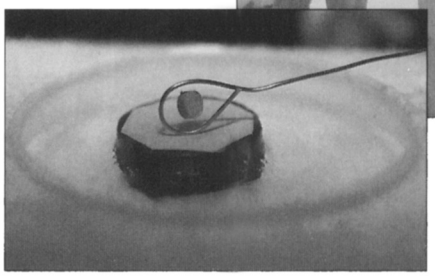

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1 *On the High T_c superconductor frontier at the 1987 Spring Meeting: C.W. (Paul) Chu (left), University of Houston; J. Bednorz (center), IBM; and S. Tanaka, ISTEC.*

2 *Levitated High T_c superconducting pellet—IBM tabletop display, 1987 Spring Meeting.*

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Table I: MRS Publishing Operations

Number of Titles Published Since 1984

MRS Symposium Proceedings: 263
International and Other Conference Proceedings: 28
Monographs: 1
Policy/Public Information Books: 2
Videotapes: 17

Journal of Materials Research
1992 Publication Data

Number of pages published: 3,524
Number of papers published: 422
Papers from U.S.A.: 51%
Papers from outside U.S.A.: 49%

One of our major dimensions apparent from the time line is the area of publications. In 1975, the first issue of the *MRS Newsletter* appeared—later to become the *MRS Bulletin* that members receive every month. In 1981, Volume 1 of the MRS Proceedings Series was published, although various symposia had already found their way into proceedings through the energetic efforts of symposia organizers, beginning in 1973 with the first MRS Symposium, which was on Phase Transitions. In 1985, MRS began handling the publication of its proceedings completely on its own from Pittsburgh headquarters. Shortly thereafter, in 1986, the Society's *Journal of Materials Research* began publication. By 1988, the *Bulletin* had increased its frequency to monthly publication. A brief summary of publication activities is given in Table I. Today, more than 250 proceedings have been published, videotapes of selected symposia have been produced, and the *Journal of Materials Research* is publishing about 3,500 pages a year, with about equal numbers of contributions from the United States and from elsewhere.

Another dimension of our early growth is the recognition given to materials researchers. Our major award, the Von Hippel Award, was first presented in 1976 to Arthur R. von Hippel of MIT. The Society's high regard for students led to the Graduate Student Awards, which were first presented in 1981. More recently, additional awards were inaugurated: the MRS Metal in 1990, the Outstanding Young Investigator Award in 1991, and the David Turnbull Lectureship in 1992.

In the membership area, university chapters and regional sections of MRS were also established during the period of rapid growth. The first MRS University Chapter was organized in 1982 at UCLA. We now have 24 chapters, as shown in Table II. MRS Sections were established in 1984, with the first sections being North Carolina and Northern California. Other milestones in the services area include the first short course offered to members in 1982, the first equipment exhibit held in conjunction with our Fall Meeting in 1984, and the establishment of a grassroots education initiative in 1991.

A more external dimension concerns the establishment of an Office of Public Affairs in Washington, DC in 1990. Our presence in Washington, although small, has given us a much better window to national policy events affecting the materials science area. Our goals are to: (1) contribute to the development of federal science and technology policy in materials-related areas, (2) provide timely information to our members, and (3) facilitate teaming with other materials-related societies to create a larger voice for the materials field. In addition to our Public Affairs Office, we have cooperated with other societies and groups in, for example, hosting the Washington Materials Forum in 1991, and through endorsement or co-sponsorship of numerous materials-related meetings. On the international front, the European MRS was established in 1983 and the International Union of Materials Research Societies was formed in 1991. IUMRS currently has nine member Societies from around the world, and sponsors several international meetings in which we participate.

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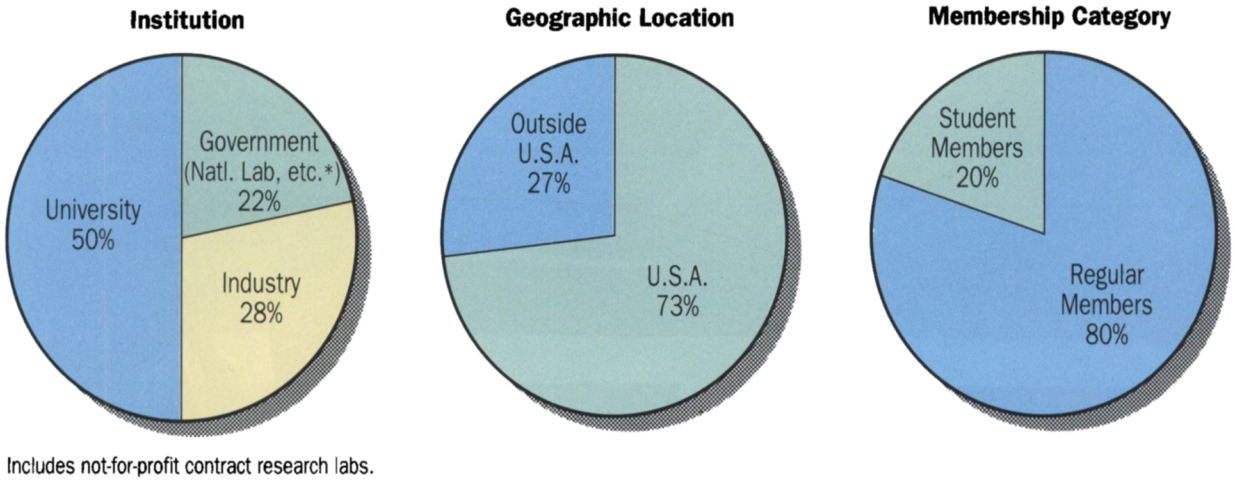
So where is the Society today? We now have more than 11,000 members, and annual revenues (1992) of $4.6 million. Our Fall Meetings in Boston typically draw about 4,000 people and the Spring Meetings in San Francisco attract nearly 2,500 people. The rapid growth of the 1980s has lessened considerably during the 1990s. It is already clear, however, that for 1993 the number of members will grow by at least 5% over last year, a surprising number in light of the difficult economic times we are experiencing. A current profile of our membership is given in the accompanying pie charts (Figure 2) and is seen to be diverse. Our membership has strong representation from universities, industry, and government/

1 David Turnbull (left), 1985 Von Hippel Award winner; John Cahn (center), 1979 Von Hippel Award winner; and Cyril Smith at the Fall 1985 Meeting.

2 Washington Materials Forum, 1991 (left to right): Congressman George E. Brown Jr, Chairman of the Science, Space, and Technology Committee; MRS representatives John Ballance, Ron Kelley, Jim Roberto, and Elton Kaufmann; and Jim Turner, Staff Director for the Technology and Competitiveness Subcommittee.

1993 MRS MEMBERSHIP COMPOSITION



* Includes not-for-profit contract research labs.

Figure 2. The composition of MRS membership by various categories.

national laboratories, with the percentage of university membership slowly climbing over recent years. The percentage of student members is 20% and of members outside the United States, 27%.

But numbers do not tell the real story. We have gone from a nucleation stage to a period of rapid growth in our "teenage years." Now, as we reach 20 and become a "young adult" as a professional society, we must take on, and increasingly do take on, broader responsibilities. These include enhancing our contributions to national science policy, encouraging the development of our field at the international level, and enhancing the recognition of materials research. Our challenge for the future is to make significant contributions at this broader level while maintaining all the youthful enthusiasm of a young adult. Regardless of our size, we need to retain the energy and dynamism of a young society, characterized by a strong volunteer involvement, a dedicated staff, and a focus on high technical quality in all that we do. Thus we move into our third decade with a vision of maintaining that special "MRS spirit" so characteristic of our earlier years.

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1989 Fall Meeting panel on strategies for implementing the recommendations of the National Research Council's MS&E study, from left: Paul Peercy, Kathy Taylor, Rustum Roy, Don Shapero, Lyle Schwartz, Merton Flemings, and Bill Appleton.

Table II: Materials Research Society Local Activity*

MRS Sections

- **Alabama (1988)**
- **East Tennessee (1992)**
- **Greater Pittsburgh (1989)**
- **New Mexico (1986)**
- **North Carolina (1984)**
- **North Texas (1985)**
- **Washington/Baltimore (1988)**
- **Western New York (1986)**

MRS University Chapters

- **Alabama A&M (1988)**
- **Alfred University (1987)**
- **Carnegie Mellon University (1985)**
- **Cornell University (1985)**
- **Johns Hopkins University (1991)**
- **Massachusetts Institute of Technology (1985)**
- **Northwestern University (1988)**
- **Pennsylvania State University (1985)**
- **Rensselaer Polytechnic Institute (1985)**
- **State University of New York–Binghamton (1992)**
- **Stevens Institute of Technology (1989)**
- **Texas A&M University (1990)**
- **University of Alabama (1991)**
- **University of Arizona (1990)**
- **University of California–Berkeley (1991)**
- **University of California–Los Angeles (1982)**
- **University of Florida (1987)**
- **University of Maryland (1990)**
- **University of Michigan (1987)**
- **University of Minnesota (1987)**
- **University of Pittsburgh (1990)**
- **University of Rochester (1992)**
- **University of Western Ontario (1992)**
- **University of Wisconsin–Madison (1986)**

***Only currently active sections and chapters are listed. Dates in parentheses indicate the years in which these sections and chapters were first established.**

1 Hengde Li (left), C.W. "Woody" White (center), and Masao Doyama toast the inauguration of the International Materials Research Committee (IMRC) at the Fall 1989 Meeting.

2 From left to right: Vivienne Harwood Mattox, Carol Jantzen, Merry Geil, and Sue Kelso at the 1990 Spring Meeting.

3 Erich Bloch (left), NSF director, and speaker in a forum on Education in Materials Science and Engineering at the 1987 Fall Meeting, chats with a graduate student.

4 Fall 1985 poster session.

5 Plenary speaker John A. Armstrong (center), IBM vice president of science and technology, with Slade Cargill (left), 1992 MRS president, and Jim Roberto, 1991 MRS president, at the 1992 MRS Fall Meeting.

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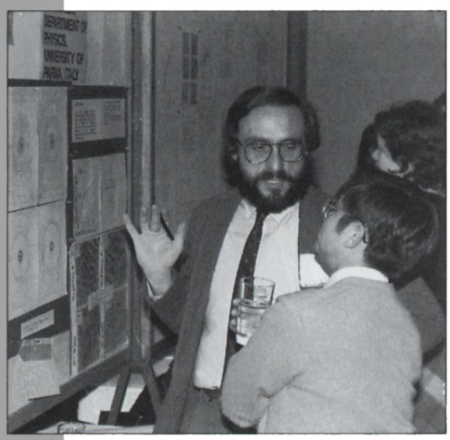

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Milestones in MRS History

1973 MRS founded at Penn State University.

First MRS Meeting (Phase Transitions and Their Applications in Materials Science, May 23-25, University Park, PA).

First book published from an MRS symposium (Phase Transitions 1973 by Pergamon Press).

1975 First issue of the MRS Newsletter distributed.

1977 Von Hippel Award presented to first recipient and award's namesake, Arthur R. von Hippel.

Society's first secretariat is established at Pennsylvania State University.

1980 First graduate student awards are given.

1981 Volume 1 of the MRS Symposium Proceedings series is published by Elsevier.

Corporate Participation program begins.

1982 First short course is offered by the Society.

First student chapter is established at UCLA.

Symposium X, Frontiers of Materials Research, debuts.

1983 The European Materials Research Society, an independent sister society, holds its inaugural meeting.

MRS headquarters office is established in Pittsburgh.

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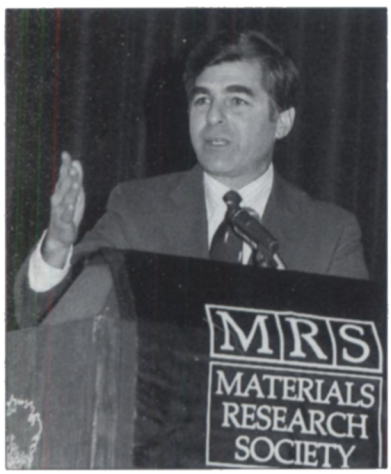

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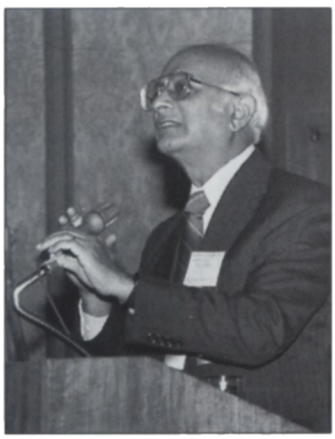

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1 International delegates attend the International Union of Materials Research Societies (IUMRS) Board Meeting in Strasbourg. Front row (left to right): M. Doyama, MRS-Japan; G.C. Chi, MRS-Taiwan; R.C. Ewing, IUMRS secretary. Back row (left to right): I.W. Boyd, E-MRS; P. Siffert, E-MRS; R.P.H. Chang, then IUMRS president; G.G. Bentini, E-MRS; E.N. Kaufmann, MRS; C. Shi, C-MRS; and S. Weng, C-MRS.

2 Governor Michael Dukakis, plenary speaker, Fall 1983.

3 Rustum Roy, during the Frontiers in Materials Research session on the "History of Materials Research," Fall 1986.

4 1987 Fall Meeting Chairs (from left) Barry E. Sheetz, J. Murray Gibson, and S. Tom Picraux, in the president's suite.

5 1984 Fall Meeting Chairs Jagdish Narayan, Paul Peercy, and Walter Brown, with 1984 MRS President C.W. "Woody" White (from left to right).

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1984 The first MRS Spring Meeting is held in Albuquerque, NM.
The Society's equipment exhibit is inaugurated.
The first MRS Sections are established in North Carolina and Northern California.
The Woody Award is presented to its first recipient and namesake, C.W. "Woody" White.

1985 MRS begins self-publishing its symposium proceedings.

1986 Journal of Materials Research begins publication.

1988 MRS Bulletin increases publication frequency to monthly.

1990 MRS Office of Public Affairs is established in Washington, DC.
Inaugural MRS Medals are given to Arthur J. Freeman and Duward F. Shriver at the Fall Meeting.

1991 Inaugural Outstanding Young Investigator Award is presented to Stuart S.P. Parkin at the MRS Spring Meeting.
The International Union of Materials Research Societies is formally established, consisting of eight Materials Research Societies from around the world.
The first Washington Materials Forum is held, co-sponsored by MRS, ACerS, ASM, APS, ACS, AVS, TMS, and FMS.

1992 Inaugural David Turnbull Lectureship is awarded to Thomas R. Anthony at the MRS Fall Meeting.

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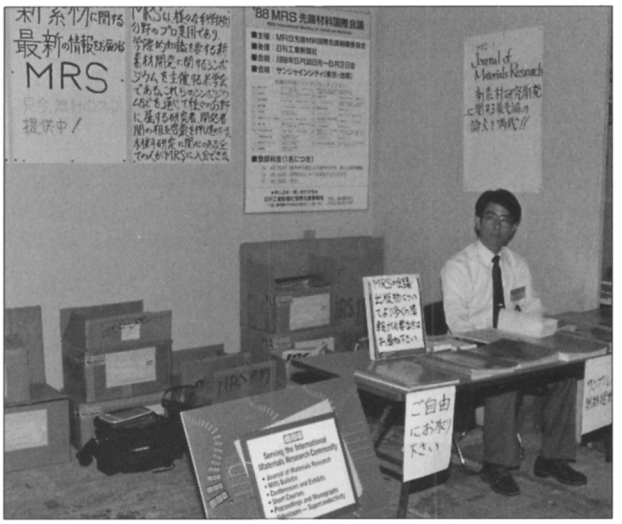

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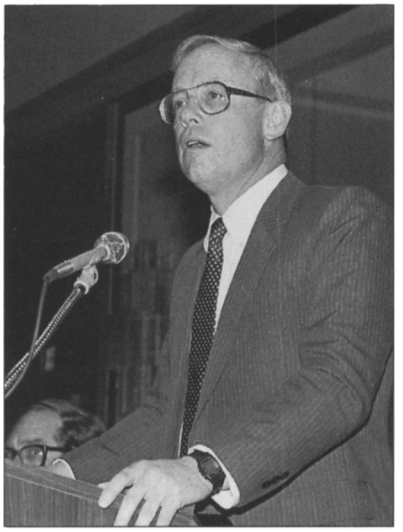

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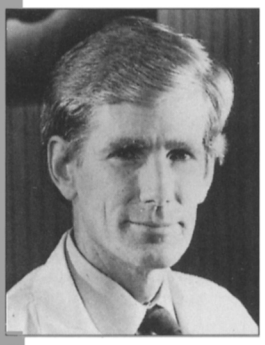

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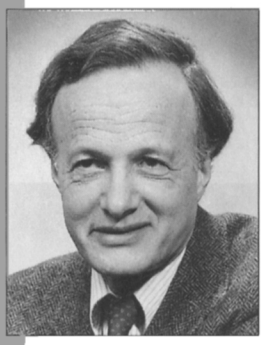

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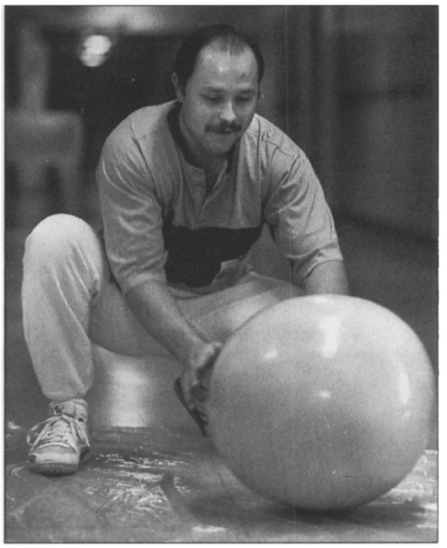

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1 *Professor Linus C. Pauling, Spring 1989 plenary speaker.*

2 *MRS Exhibit booth at the Japanese Trade show before the International Conference on Advanced Materials, ICAM '88.*

3 *Fall 1986 Equipment Exhibit.*

4 *Nobel Prize winner John Bardeen speaks at the MRS 1987 Fall Meeting about High-Temperature Superconductors.*

5 *Harry Leamy, 1983 MRS President.*

6 *John Baglin (left), F.P. Glasser (center), and R.P.H. Chang break open the sake barrel during opening ceremonies for the International Conference on Advanced Materials, ICAM '88..*

7 *Plenary speaker William C. DeVries discusses the total artificial heart at the Fall 1987 Meeting.*

8 *John Polanyi, 1986 Nobel Prize winner in chemistry, speaks at the 1987 Fall Meeting about laser etching and writing.*

9 *The Alfred University Chapter performs experiments on a 45.4 Kg sphere of Dilatant Compound 3179™ or "Silly Putty™."*

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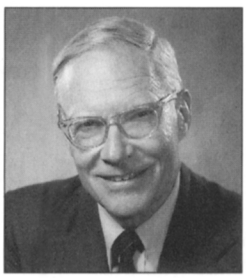
1 Plenary speaker Robert Noyce (right) with Jim Roberto at the 1989 Fall Meeting.

2 Charles Duke (left), C.W. "Woody" White (center), and Shigeyuki Sōmiya during the Fall 1986 Meeting.

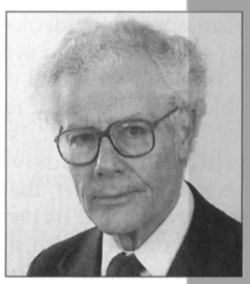
MRS VON HIPPEL AWARD RECIPIENTS

The Society's highest honor, the Von Hippel Award, recognizes those qualities most prized by materials scientists and engineers — brilliance and originality of intellect, combined with vision that transcends the boundaries of conventional scientific disciplines. Presented annually at the MRS Fall Meeting, and named in honor of its first recipient, the Von Hippel Award includes a cash honorarium and a unique trophy — a mounted ruby laser crystal symbolizing the many-faceted nature of materials science.

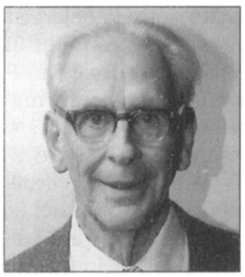
1977
Arthur R. von Hippel



1978
William O. Baker

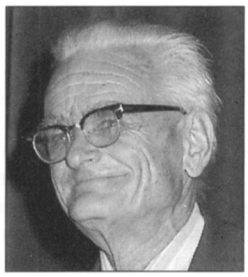


1979
David Turnbull

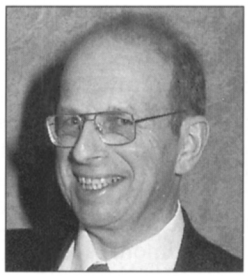


1980
W. Conyers Herring

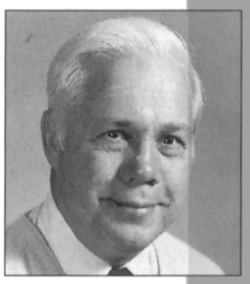
1981
James W. Mayer



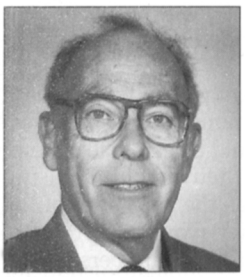
1982
Clarence M. Zener



1983
Sir Peter B. Hirsch

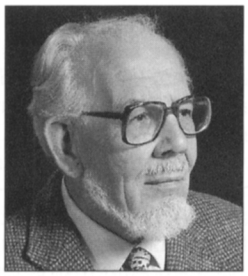


1984
Walter L. Brown

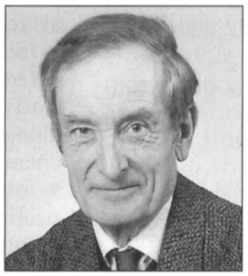


1985
John W. Cahn

1986
Minko Balkanski

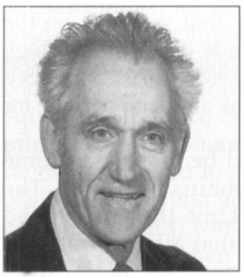


1987
Sir Charles Frank

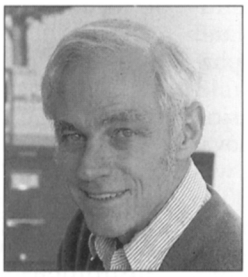


1988
Jacques Friedel

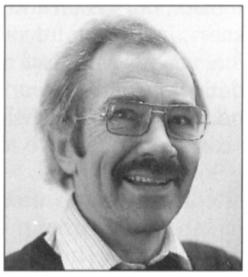
1989
John B. Goodenough



1990
Robert W. Balluffi



1991
Theodore H. Geballe



1992
Michael F. Ashby