

Figure 3: Worldwide participation at the E-MRS Spring Meeting 2000.

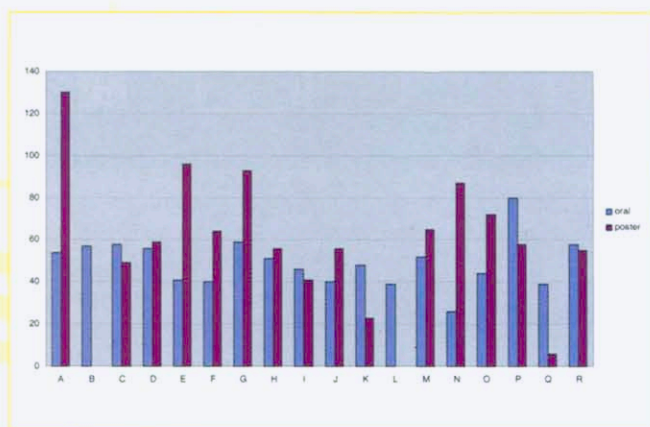


Figure 4: Participation statistics for the 18 symposia of E-MRS Spring Meeting 2000

participants (Figure 3). The holding of the General Assembly of the International Union of Materials Research Societies (IUMRS) at the conference, and special events to mark the development and history of E-MRS, added to the sense of occasion at a most memorable Spring Meeting.

In this special feature, reports from a number of the symposia at E-MRS Spring Meeting 2000 are carried, together with articles on the plenary session. Participation statistics by symposium are shown in Figure 4.

Welcome Address by Prof. J.M. Martínez-Duart

“Ladies and gentlemen:

I would like to welcome all of you, in this millennium year 2000, to our traditional Spring Meeting of the European Materials Research Society, which we are holding this year together with the 7th International Conference on electronic Materials (ICEM). It is also true this time, more than ever, that our conference constitutes by far the largest and more interdisciplinary materials forum in Europe, especially in the area of functional materials. This year, for instance, we are having 18 specialized symposia and we welcome over 1500 participants. At the same time we are also holding in this occasion the General Assembly of the International Union of Materials Research Societies (IUMRS), with many delegates from countries outside Europe, including the USA, Japan and China. Of course, the common objective of these conferences, as well as the aim of IUMRS, is to promote research in the field of advanced materials, as well as establishing relations between materials scientists working in various areas around the world.

Another ceremony we are again holding this year is related to the Graduate Student Awards. As you probably know, these keenly contested prizes are given to those graduate students, one or two per symposium, who have participated in papers showing significant and timely research results. In addition, the selected students should show, in the opinion of the selection committee, a promise for future high quality research in materials science. By giving these recognitions to the graduate students, we fulfil in my opinion, one of the main objectives of our Society, which is the recognition of excellent research wherever is conducted.

One observation I would like to make to our European science policy-makers is that, looking to all large European programmes, sometimes it seems as if the field of materials has disappeared from them, and is being substituted by societal objectives: improving communications, saving energy, cleaning the environment, improve medical attention, etc. But we should not forget, that research in materials is at the core of solving most of societal problems. Thus, for instance, improving communications is only possible through development of new materials for optical fibres, semiconductor lasers and detectors; improving the environment comes mainly through the recycling of materials; medical attention, specially for elderly people, is linked, to a large extent, to the development of new biomaterials and biosensors; saving energy is related to the development of high temperature ceramics and superalloys, as well as advanced materials for solar photovoltaic cells, etc.

Therefore in my opinion, the European scientific policy-makers should strengthen the programmes in basic research in materials. For instance, I think that, at present, everyone of us would agree that nanotechnologies will dominate most of the technical fields in one or two decades from now, and there will be a merge between materials scientists and ‘bio-scientists’ i.e., those researchers working in bio-chemistry, bio-medicine, etc. We also think that in the future we will learn to copy nature in the intelligent and efficient manner in which materials, both organic and inorganic, are grown. In this sense, it is very encouraging that President Bill Clinton of the USA, announced recently an amazingly large programme in

nanotechnologies. In my opinion, countries losing the 'nanotechnology revolution' will have a hard time catching up, both scientifically and technologically, since nanotechnologies are at the core of many applications of functional materials, based on nanotubes, quantum wires, superlattices, for example.

To finish, I would like to thank every one of you, especially those coming from countries outside Europe, for your

participation. Special recognition should be given to the Conference Chairmen, Dr Peter Glasow and Dr Gabriel Crean as well as to our Secretary General Prof. Paul Siffert for making this event possible. I hope that these four days that we are spending together in this amicable environment will be very fruitful for you from the scientific point of view, and that you will also find time to enjoy this wonderful and historical city of Strasbourg."

E-MRS Spring Meeting 2000 symposium reports

Symposium reports have been compiled by some symposium co-chairs, and are presented here to disseminate aspects of interest to a wider audience among E-MRS members.

SYMPOSIUM A REPORT

The most important development of thermal plasma processes is in the field of new materials production and surface treatments. The link between the High Temperature Material Society and MRS emphasizes the original aspects of plasma processes in the elaboration of new materials as powders or coatings together with their characterization (optical, electrical, thermo-mechanical properties, thermal barriers, coatings against corrosion, wear...)

TPP6 Symposium topics were: fundamental science of thermal plasmas, modeling, measurements, non equilibrium effects, plasma production by arcs or radio frequency or microwave or corona discharges, materials elaboration for space industry, optical fibres, new metallurgical processes, polymeric materials, waste destruction...

Plasma processes used in industrial production of materials are now automatized with on line control. This has been made possible thanks to the great strides made during the 1990s in the understanding of fundamental chemical and physical processes involved. These strides are the result of careful mass, momentum and energy balances within out-of-equilibrium transient or stationary plasma flows.

Even if, for example, the phenomena at the electrodes of a dc torch are yet not well understood (3D transient phenomena) reliable models of plasma flows, even in 3D, are available together with the corresponding thermodynamic and transport properties. These models are backed by diagnostics such as laser-scattering, Phase Doppler Anemometry, fast (50 ns) pyrometry...TPP6 has been a success with 120 papers presented (oral or poster) and 16 invited or topical lectures.

SYMPOSIUM B REPORT: 6TH IMF WORKSHOP

The 'Initiative for Inert Matrix Fuel' deals with the issue of plutonium excess and minor actinides and their recycling in reactors. A working group has been acting in the field of inert

matrix fuel (IMF) since 1995 and organized the 6th IMF workshop within the framework of the European Material Research Society 2000 spring meeting in Strasbourg. The organizing board was composed of C. Degueldre (PSI, Switzerland), J. Porta (CEA, France), C. Lombardi (Politecnico de Milano, Italy), H. Matzke (ITU, Karlsruhe, Joint Research Centre, CEC), S. Ion (BNFL, Sellafield, UK) and J.M. Paratte (PSI, Switzerland).

The workshop was divided into two parts covering materials science and reactor science and, as usual, brought together many scientists and experts from both fields. Both parts of the workshop were subdivided into three sessions: basic properties, behaviour under irradiation and IMF dispositions (in the material science area) and sensitivity & benchmark, transient & safety and conceptual studies (in the reactor science area).

The chair & co-chair persons and session topics were respectively :

Basic properties: C. Degueldre (PSI) & Y.W. Lee (KAERI).

This session dealt with IMF fabrication and characterization with the emphasis on density, porosity, lattice parameters, thermo-physical properties, hardness, compressibility, phase diagram determination and modelling, for solid solutions with actinides (or analogous) and for composite materials.

Behaviour under irradiation: H. Matzke (ITU) & R. Ewing (Uni Michigan).

Fundamental aspects of IMF behaviour under irradiation were presented including: characterization of IMF under irradiation e.g. with accelerators, and studies of relevant properties such as swelling, phase transformation and fission product retention.

IMF Disposition: C. Brown (BNFL) & G. Lumpkin (ANSTO).

The two strategies for IMF utilization after use in reactors are the once-through-then-out for geological disposal, or multi-reprocessing. This session addressed both approaches considering calculations as well as post irradiation examination results, in-pile behaviour tests with solid solutions or composites, as well as relevant data for geological disposal of spent IMF.