

Positions Available

**RESEARCH
SCIENTIST
POSITION**

**The University
of Michigan**

A position of assistant or associate research scientist is available in the Department of Materials Science and Engineering at the University of Michigan. Applicants should have a PhD degree, expertise in electron microscopy and surface analytical techniques, and should wish to develop independent and cooperative research programs. A demonstrated materials research potential or record is required. Duties will include service as manager of a new electron optics laboratory.

Send resume and list of references to:

Professor Ronald Gibala,
Chairman
Department of Materials Science
and Engineering
The University of Michigan
3062 H.H. Dow Building
Ann Arbor, MI 48109-2136

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Professional Services

CONSULTANT

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9800 McKnight Road
Suite 327
Pittsburgh, PA 15237

SURFACE SCIENCE ACCELERATOR ENGINEER
Department of Nuclear Engineering, The University of Michigan

An Engineer position is available at the Michigan Ion Beam Laboratory of the Department of Nuclear Engineering in areas related to the operation and maintenance of and experimentation with several high-voltage ion accelerators for surface modification and analysis. Applicants should have a BS in surface physics or a related field with experience in vacuum systems, electronics, radiation instrumentation, and high voltage systems.

The position involves operating, maintaining, and upgrading a 2 MV Van de Graaff

accelerator, a 400 kV ion implanter, a 1.7 MV tandem accelerator, and a vacuum evaporator for surface modification and analysis. The position also involves assisting with experiments, which will involve frequent interactions with students, faculty, and technical staff.

Please submit resume and addresses of three references to Prof. G.S. Was, Department of Nuclear Engineering, 213 Cooley Bldg., The University of Michigan, Ann Arbor, MI 48109; (313) 763-4675.

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POSTERMINARIES

**Environmental Impacts
of the First Kind**

What picture immediately comes to mind when you hear the words "environmental impact"? I envision some aspect of man's industrial technology pummeling the biosphere. Clean air, potable water, our nontoxic food chain, healthy flora and fauna, the surfaces of our *objets d'art*, and, ultimately, life on the planet are all under attack from the noxious byproducts of our industrialized society. Is it any wonder we automatically picture these assaults.

What preoccupied our ancestors in earlier, simpler times was not what man could do to the natural environment but what the natural environment could do to man. The latter is an environmental impact of the first kind. Today we are still occasionally reminded of our vulnerability to the immense forces of a natural disaster—the earthquake in Mexico and the floods in Bangladesh, for example. For the most part, though, the subtler impacts of our natural and manmade environment are not at center stage.

Let's focus on one area where the subtle impact is often alluded to in the MRS BULLETIN and other technical news media. What about the deteriorating state of U.S. industrial competitiveness, the broken linkages in the innovation chain, the dearth of broadly trained materials professionals particularly in the manufacturing theater? What do they have in common with "environmental impacts of the first kind"?

A few hints! Quoting Prof. James Williams, dean of Carnegie Institute of Technology, Albert Clogston notes in an opinion paper on innovation that "... we must maintain a research *climate* on our campuses that permits the full intellectual talent of our faculty to be invested in the creation of knowledge.... A highly structured short-term payoff *climate* tends to stifle the creativity which has been the hallmark of academic research...." [Emphasis added.]

Or to reiterate a statement by Alan Chynoweth (Bell Communications Research) reported elsewhere in this issue of the BULLETIN, "... we need to improve the prestige of multidisciplinary applied science, especially manufacturing technology, on campuses to attract students...." Chynoweth also pinpointed a cause for stunted U.S. long-range industrial R&D as being life under "... the tyranny of the quarterly report."

"Publish or perish" pressures mitigate against pursuit of the tough long-range problems. Export controls chill technical exchanges with international colleagues and hamper open meetings in the United States. Antitrust laws in our litigious society discourage industrial consortia. Also how fares the overall image of the scientist and engineer in today's society? And how does that impact career choices?

No need to string together more anecdotal references to show that the health of materials R&D in the U.S.—from the campus to the factory—is adversely impacted by its environment. Many see that the prudent path is proper investment in the long-term robustness of our science and technology base. But they are impotent in the face of short-term political and economic exigencies. Perhaps such attempts as the new MSE Study of the Academies to spotlight these environmental impacts of the first kind will help clean up our R&D environment and pay off our mortgage on the future.

E.N. KAUFMANN

1. J.C. Williams, *Carnegie Inst. Technol. Eng. News* 5 (1985) p. 5.
2. A.M. Clogston, *Science* 235 (1987) p. 12.