

Positions Available

TENURE-TRACK MATERIALS SCIENCE POSITION

Bowling Green State University anticipates appointment of a physical scientist, materials scientist, or engineer to participate in building a program of research and instruction in materials science, with interactions with researchers in physics, chemistry, and the Center for Photochemical Sciences. Successful candidate should have interest and experience in one of the following research fields: 1. development of novel photoresponsive materials, or materials synthesized using radiative methods; 2. preparation and development of materials with important electrical/magnetic applications (e.g., magnetic thin films); 3. development and investigation of important properties of polymer composites or other composite materials. Novel proposals in materials research will also be considered. The University is prepared to provide substantial support for program initiation. Tenure-track appointment at associate or assistant professor level in physics, depending upon qualifications. Send all applications and three letters of recommendation to: Dr. R.I. Boughton, Dept. of Physics and Astronomy, Bowling Green State University, Bowling Green, OH 43403.

Bowling Green State University is an equal opportunity employer.

SOLID STATE INORGANIC CHEMIST

The Department of Chemistry at Arizona State University is seeking an individual with expertise in the synthesis and structural study of solid state inorganic materials to fill a tenure-track position. Research in solid state chemistry at Arizona State University is highly interdisciplinary and strong links exist with the Physics and Engineering Departments at ASU, through the interdepartmental Center for Solid State Science. Rank is open. PhD required. Application materials, including curriculum vitae, list of publications, statement of research plans and teaching interests, and three letters of recommendation, should be sent to: Dr. Paul F. McMillan, Chair, Solid State Search Committee, Department of Chemistry, Arizona State University, Tempe, AZ 85287-1604. Review of applications will begin on March 1, 1992 and continue on a monthly cycle until position is filled.

ASU is an Equal Opportunity/Affirmative Action Employer.

**MATERIALS SCIENTIST
Protein Polymer Technologies, Inc.**

Protein Polymer Technologies, Inc. has created and is commercializing unique and proprietary engineered protein polymers targeted toward a wide variety of biomedical and specialty industrial markets. Like natural proteins, these polymers can regulate the function of complex biological systems. Like synthetic polymers, these proteins can be processed into a wide range of application specific forms, whether as coatings, films, gels, or fibers.

A senior position is immediately available for a self-motivated individual who can make significant contributions in the development of polymer processing techniques and in the characterization of material properties. Candidates should also be able to assist in the design of new polymers.

Qualified candidates should have a PhD in a relevant field and at least 5 years of corporate experience with a successful track record. A strong background in medical devices, biomaterials, and both protein and synthetic polymer characterization is highly preferred.

If you seek the challenge of building a pioneering materials science capability, please forward your resume, in confidence, to: Protein Polymer Technologies, Inc., Dept. M3, 10655 Sorrento Valley Rd., 1st Floor, San Diego, CA 92121.

An Equal Opportunity Employer.

**FACULTY POSITION
Chemical Engineering
University of Houston**

The ChE Department seeks candidates who show exceptional promise for establishing innovative research and educational programs. Disciplinary background is less important than focus and vision. Rank and salary are open. Please send a curriculum vitae, a detailed description of research and teaching interests, names of at least three references and sample publications to: Prof. Raj Rajagopalan, Faculty Search Committee, University of Houston, Houston, TX 77204-4792.

UH is an equal-opportunity/affirmative-action employer and invites applications from qualified women and minorities.

Services/Equipment

Perkin-Elmer Model 590 Scanning Auger Microprobe for sale. System includes specimen intro. and fracture stage. Currently in good operating condition and under factory service contract that may be transferred to new owner, subject to manufacturer's approval. Will accept best offer over \$85,000. Buyer responsible for crating, shipping, transportation and installation. For additional details write: J.P. Engel, Michigan Technological University, Purchasing Dept., 1400 Townsend Drive, Houghton, MI 49931; telephone (906) 487-2510, or fax (906) 487-2245.

Michigan Technological University is an equal opportunity educational institution/equal opportunity employer.

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- Veeco Microtech—3" Beam



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Advertisers in This Issue

APD Cryogenics	22
BOMEM	14
Elsevier	17, 63
Gern Dugout	13
High Voltage Engineering Europa B.V.	inside front cover
Huntington Laboratories	3
Lake Shore Cryotronics	back cover
MDC Vacuum Products	11
Mellen Company	12
MKS Instruments	27
Nikko Trading Corporation	42
Park Scientific	27
Plenum	13
Quantum Design	inside back cover
Topcon Technologies	19
Virginia Semiconductor	15
Voltaix	9

In the April Issue...Guest Editor Thomas W. Eagar, director of MIT's Materials Processing Center, focuses on "Materials Manufacturing" with a series of seven articles on:

New criteria for success in commercializing advanced materials • How Motorola eliminated the need to inspect solder interconnections during electronics manufacturing • Solving GaAs IC manufacturing problems, with examples from Hewlett-Packard • Using mathematical models of the injection molding process to improve quality and design of plastic components • How a team at Owens-Corning Fiberglas successfully used Statistical Quality Control • Using statistical process control and metallurgical theories to achieve higher quality aluminum can stock • How to use "Quality Architecture," a pioneering concept to build quality control into the design of a product from the outset.

POSTERMINARIES

A Postterminaries in Three Movements

A premise: The R&D Enterprise is sick. The symptoms presented by the patient must be examined, a diagnosis must be arrived at, and a treatment must be prescribed before the patient dies. In January, we tackled elucidation of symptoms and their interrelationships. This month we search for root causes. Then, if the patient's insurance coverage is verified, the treatment and prognosis complete our visit to the doctor. We expect those hoping for a miracle cure will be disappointed. Homemade remedies may be sent to the MRS Bulletin as Letters to the Editor.

II. The Disconnect Disorder The Failure of Rational Analysis

R&D now faces a myriad of complex symptoms of trouble that seem out of control. Our anecdotal list in Part I only scratched the surface, but we prescribed a precautionary sanity test to rule out dementia in advance.

Scientists are trained to grapple with sets of complex interacting phenomena. We understand and master them by isolating individual cause-and-effect relationships. Then we distill one or a few underlying processes which succumb to rational explanation. This logical approach, however, has yet to deliver us from our current plight, perhaps because from our frame of reference, only problems we don't own and can't control are identified.

Those arbitrary and capricious, irrational forces with the checkbooks—those non-technical types who wouldn't recognize Nobel-quality research if it fell on them—they are the causal villains who own the problems and we are but the helpless and hapless affected victims. Some have even said something along these lines aloud! If

you take that bellyaching seriously, you have failed the sanity test, and our quick and easy self-diagnosis is delusions of paranoia. This is, of course, too simple. A principal symptom does indeed include our being grossly misunderstood, but not by ignorant persecutors. We are sane and they are sane, albeit in disjointed reference frames.

Changing Ponds

Mindsets from a well-fed past make us slow to notice that our fields' public *raison d'être* has evolved and catches us acting as if in the throes of an identity crisis. This is not our malady *per se*, just as the frenetic flipping and flopping of a fish out of water is not a disease but an inability to recognize and adapt quickly to a change in environment. Believing we can flop back into the same old pond has hampered our recognition of the true nature of the ailment the providers (we) and the customers (they) share. Simply stated, both suffer from a form of *sensory deprivation*. Inadequate *useful* communication across many important intra- and inter-institutional interfaces has allowed us each to define self-serving versions of the dilemma and its cure without due influence by external context. You see, they see a different pond.

The markedly shifted context and rationale for post-Cold-War support of R&D from national security (which emphasized high technical competence *per se*) to economic development (which focuses on near-term measures of success) has been well described in articles such as that by Michael Schrage some time ago.¹ We are apparently quite hard to convince!

Customer Recognition and Relations

As recently as last October, Congressman George Brown claimed, "Most Members of Congress have sort of a warm and fuzzy feeling that science is good. But when it comes down to the nitty-gritty, they don't know why it's good or what expenditure of funds produces good research or science policy."² Clearly, we remain an enigma to those past, present, and prospective benefactors who dearly want to support us and have been and are themselves terribly misunderstood. Misunderstood by us! By us who now suffer not from *delusions* of grandeur but from *withdrawal* from the grandeur of the research labs of the gone and best forgotten "golden age" of post-World-War-II blindly generous funding.

We and our resource-controlling counterparts talk past each other only partly because our languages differ. Equal blame must be placed on differing perceptions of the nature of our relationship. The technical community has been particularly poor at recognizing its quid pro quo basis. All the communication interfaces needing attention fall in one category. They are interfaces between customer and vendor. Rather than being a crass commercial analogy, this is a realistic description of roles. No matter how close to the ivory tower we live, receipt of research support implies delivery of a product or service that the supporter expects has been bought. According to Schrage,¹ "Only the blissfully naive or self-deluded believe that society funds basic science for the sake of pushing back the frontiers of knowledge."

The idea that there is a communications disconnect with the customer is sinking in