IEEE Madison Section Newsletter

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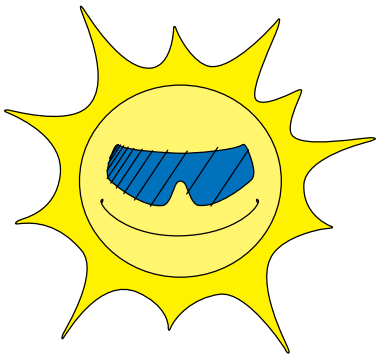
## Why Doesn't My Electricity Come from the Sun? Future Materials for Harnessing Solar Energy



**Date/Time:** Thursday, March 18, 2010, 11:45 AM – 1:00 PM
**Speaker:** Mike Arnold, Assistant Professor - Department of Materials Science & Engineering, UW-Madison
**Location:** Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), 608.829.1444
**Menu:** Pizza buffet, salad and soft drinks ($5.00 members, $10.00 non-members, free for UW-Madison student members)
**RSVP:** by March 15th to Charles Gervasi via e-mail (cj@cgervasi.com)

*Non-member guests are always welcome!*

The Earth is continuously bathing in over 10^17 watts of sunlight. This talk will discuss the science, technology, and economics of using photovoltaic solar cells to collect and convert a fraction of this free solar energy into electricity. In particular, this talk will focus on the materials and composition of photovoltaic solar cells and the principles of their operation and will attempt to answer the question of why past and current solar cell technologies have failed to become widespread. The talk will conclude by discussing the future of solar photovoltaics and new materials and technologies (with a focus on those being pursued by my research group such as semiconducting carbon nanotubes) that have the potential to boost the efficiency, decrease cost, and increase the practicality of solar cells..

Michael S. Arnold joined the faculty of the Department of Materials Science and Engineering at the University of Wisconsin-Madison as an assistant professor in August 2008. He directs the Advanced Materials for Energy and Electronics Group at UW-Madison and is a leader in the research of novel materials for next generation solar photovoltaic, optoelectronic, and semiconductor logic devices. Prof. Arnold graduated summa cum laude from the University of Illinois at Urbana-Champaign with a Bachelor of Science degree in Electrical Engineering in 2001. He earned his Doctor of Philosophy degree in 2006 from Northwestern University in Materials Science and Engineering. Prof. Arnold also conducted post-doctoral research at the University of Michigan at Ann Arbor where he studied carbon-based electronic materials for high-efficiency white lighting and photovoltaics.

## Building Accessibility directly into the Global Internet: Making the Internet easier to use for people of all ages and abilities.

**Date/Time:** Thursday, April 15, 2010, 11:45 AM – 1:00 PM
**Speaker:** Gregg Vanderheiden Ph.D., Director Trace R&D Center
**Location:** Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), 608.829.1444
**Menu:** Pizza buffet, salad and soft drinks ($5.00 members, $10.00 non-members, free for UW-Madison student members)
**RSVP:** by April 12th to Charles Gervasi via e-mail (cj@cgervasi.com)

TRACE CENTER
UNIVERSITY OF WISCONSIN-MADISON

*Non-member guests are always welcome!*

Broadband technologies are rapidly becoming integral to education, commerce, employment, community participation, health and safety Yet there remain multiple barriers to effective and affordable access by people with disabilities, elder, or those with low literacy creating an increasing digital divide. There are assistive technologies that can provide access for some. However it is not available for all disabilities, not affordable by many, and lags mainstream developments and deployments. Even when the latest AT is close to the latest IT, few people have the latest version. The cost of keeping up with mainstream technologies reduces resources available for innovation in assistive technologies and new directions in broadband technologies will require an already strapped AT industry to retool and re-architect their products. We are moving to an ICT environment with a profusion of hardware models (desktop, laptop, netbook, smartphone, tablet, set top box, game systems, players), multiple operating systems (Windows, Mac, Linux, Chrome OS, iPhone, Android, Windows Mobile, Symbian, Maemo (Nokia), Bada (Samsung), WebOS, etc.), hundreds of software applications that embed another universe of widgets, plug-ins, and players, and a networked information environment that adheres to no standard and mutates far beyond the initial concep-

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tion of the Web. Our current access technologies and infrastructure cannot handle this; the assistive technologies that now exist do not address all disabilities well, particularly cognitive, language, and learning disabilities, deaf-blindness and the mixed problems faced by elders; current assistive technologies often add, rather than reduce, complexity; finally, but importantly, people are not aware of what is possible, see it as complicated, and do not have any easy way to determine that there is something that can help them.

A coalition of academic, industry and non-governmental organizations and individuals are coming together to promote the creation of a National Public Inclusive Infrastructure (NPII) to address these problems. The purpose is to ensure that everyone who faces accessibility barriers due to disability, literacy or aging, regardless of economic status, can access and use the Internet and all its information, communities, and services for education, employment, daily living, civic participation, health and safety.

An NPII would provide key software enhancements to the physical infrastructure to allow lower cost accessibility that could be invoked on any computer, anywhere. Its key components would be a cloud based delivery system that would allow anywhere, any computer access, a personal preference system to allow systems to automatically configure themselves to users, a system of wizards to make creation of a preference profile simple even when a professional is not available, a metadata server to allow users to find accessible media or captions or descriptions for inaccessible media, a trusted source for malware free solutions, a rich development environment with common building blocks, and an awareness program to make more people aware of what is possible for them. All of the NPII components are being designed to support both commercial assistive technologies and free, built-in access features (universal design). The NPII will include a delivery system, personalization profiles and a rich development system and common modules. In addition to lowering development costs and increasing the number of solutions for different disabilities, the NPII can also enable new types of assistive technologies and services, including assistance-on-demand services that allow consumers to invoke computer or human assistance whenever and wherever they need it. The goal is a richer set of access options that it is less expensive to create and distribute and that can address the needs of a wider range of disabilities than is possible today. And a model infrastructure that can be replicated internationally and bring this wide variety of access options and the lower cost delivery system for both commercial and free access features to countries world-wide.

Gregg Vanderheiden is a professor of Industrial and Biomedical Engineering, and director of Trace R&D Center at the University of Wisconsin-Madison. He has worked in technology and disability for more than 38 years and currently directs the NIDRR Rehabilitation Engineering Research Center (RERC) on Information Technology Access, and co-directs the RERC on Telecommunications Access (joint with Gallaudet University).

Dr Vanderheiden was a pioneer in the field of Augmentative Communication (a term taken from his writings in 1979), and worked with people having physical, visual, hearing and cognitive disabilities. His work with the computer industry led to many of the access features that are standard today. For example, access features developed by Dr. Vanderheiden and his team (e.g., StickyKeys, MouseKeys, etc.) have been built into the Macintosh OS since 1987, OS/2 and the UNIX X Window system since 1993, and more than half a dozen were built into Windows 95, 98, NT, 2000, XP, Vista and now

System 7. His work is also found in the built-in access features in ATMs, Point of Sale terminals, and cross-disability accessible USPS Automated Postal Stations, as well as the accessible Amtrak ticket machines, and in airport terminals.

Dr. Vanderheiden has served on numerous professional, industry and government advisory and planning committees including those for the FCC, NSF, NIH, VA, DED, GSA, NCD, Access Board and White House. Dr. Vanderheiden served on the FCC's Technological Advisory Council, was a member of the Telecommunications Access Advisory committee and the Electronic Information Technology Access Advisory Committee (508 and 255 refresh) for the US Access Board, and served on the steering committee for the National Research Council's Planning Group on "Every Citizen Interfaces," and the National Academies' Institute of Medicine Committee on the Future of Disability in America.

He has received over 30 awards for his work on technology and disability include the ACM Social Impact Award for the Human-Computer Interaction Community, the Ron Mace Award, the Access award from AFB, the Yuri Rubinski Memorial World Wide Web Award (WWW6), and the Isabelle and Leonard H. Goldenson Award for Outstanding Research in Medicine and Technology (UCPA).

## Writing Effective and Responsible Job Reference Recommendations

*BY TERRANCE MALKINSON*

At some point in your career, you will probably be asked to provide a recommendation for someone seeking a job. In today's tightly contested job market, the personal recommendation is important. Recruiters receive many applications from equally very qualified candidates. Reference recommendations from a past employer or a personal contact play a critical role in the decision of who is offered the job.

This recommendation may be in the form of a letter requested by the job-seeking candidate to be included with the application or may be requested by the potential employer after the candidate is short-listed. Alternately, a potential employer may simply telephone you for your opinion.

You should feel honored that you were asked for your opinion on a candidate's suitability for a position. This is professional responsibility that has important implications both for yourself and for the candidate. It is critical that you be totally honest and unbiased with what you say about the candidate, and only communicate information that you are confident is accurate.

When asked to provide a recommendation, the first question you should to ask yourself is: are you prepared to put your credibility on the line by recommending the individual? Should you feel that you do not know the individual well enough, or that for other reasons you cannot recommend the person, it is best to simply thank them for considering you but decline without communicating the reason for declining.

You must also know the date by which the reference is to be received by the potential employer. If you cannot meet this deadline, you should decline.

Never take the short-cut of asking the candidate to write his own recommendation or use a "form letter" which you will then sign. Recruiters are savvy and can sniff out form letters and can often spot a client's own prose. An honest and genuine letter of recommendation will go a lot further toward enhancing a candidate's credibility than an

autobiographical endorsement.

Should circumstances permit, it is a good idea to obtain information about both the candidate and the position he is pursuing, such as a current resume and a job description. Determine to whom you should address the letter. You are writing to a person, not "to whom it may concern." The recruiter will want to know how long you have known the candidate and your relationship to the individual.

Interviewing the candidate to determine why they are interested in this position, and what strengths and weakness they would bring to the job might also be considered. Perfection in a candidate is neither required nor expected. The recommendation will be taken much more seriously if you are candid, rather than providing only glowing superlatives. What is important to the recruiter is to offer the job to the right person. Specific examples of achievements of the candidate that are relevant to the new job are important. Use action verbs and the active voice when describing accomplishments, skills and strengths.

Three areas of particular interest to recruiters and employers, and questions for potential discussion in an employment recommendation include:

### Social Competence

How well does the individual work with others? Is she team-oriented, cooperative, congenial, open-minded, and understanding? Does she have effective written and oral communication skills? Does she understand how to work in today's diverse, multi-generational, and global workplace?

### Work Competence

Is the candidate able to apply training and experience to get results? Are his knowledge and skills up-to-date, and is he able to learn quickly and continuously? Does he have a network of professional associates to network with? Does he plan and organize work effectively, completing assignments in a timely manner, accurately and thoroughly? Does he possess a good work ethic exhibiting punctuality and little unexplained absenteeism?

### Character Attributes

Is the individual enthusiastic, motivated, self-starting, creative, a problem-solver, industrious, an independent logical thinker, perceptive, positive, emotionally stable and exercises good judgment, with honesty and integrity? Does the candidate have leadership qualities? Does she handle conflict, uncertainty and stress?

Providing an employment job reference recommendation is an important professional responsibility. Accepting this task will give you a good feeling of contributing to the success and future of a fellow human-being. Always remember that someday even you to may have the need to ask others for a letter of recommendation.

### For the Job Seeker

As an aside, it is essential that a departing employee not "burn bridges." Most recruiters will request references from previous employers. Never, under any circumstances, should a departing employee criticize the company or the people in the company that he is leaving. Doing so can haunt a job seeker for the rest of his career. Memory is long and communication in today's world is quick.

Additionally, it is important that an individual leaving a position recognize that the average employee will change jobs as many as ten times during a career. No matter how secure a job is, it is important to always be on the outlook for people who might serve as job references. For example, this may be a mentor, a co-worker, a client, or it may be an influential business or social contact. Growing professional relationships with these people can pay dividends when embarking on a job seeking campaign. References do not always need to be former employers; a good mix of references that have different perspectives is valuable. Each can play an important role in unexpected or planned job-seeking.

Whether successful or not in obtaining a desired position, the candidate should always express gratitude to those who were supportive in a job seeking campaign.

*Terrance Malkinson is a communications specialist, business analyst and futurist. He is Vice-Chair of the IEEE-USA Communications Committee, an international correspondent for IEEE-USA Today's Engineer , editor-in-chief of IEEE-USA Today's Engineer Digest, associate editor for IEEE Canadian Review, and a member of the editorial advisory board of IEEE The Institute. He was an elected Senator of the University of Calgary and an elected Governor of the IEEE Engineering Management Society as well as an elected Administrative Committee member of the IEEE Professional Communication Society. He has been the editor of several IEEE conference proceedings, and past editor of IEEE Engineering Management. He is the author of more than 385 publications, and is an accomplished triathlete. His career path includes being an accomplished technical supervisor and medical researcher at the University of Calgary a business proposal manager for the General Electric Company, an associate for Sears Canada Inc. and research administrator with the School of Health and Public Safety/Applied Research and Innovation Services at SAIT Polytechnic in Calgary Canada.*

*The author is grateful to the professional support of the Haskayne School of Business Library at the University of Calgary.*