

The Journal of Technology Studies

A refereed publication of *Epsilon Pi Tau* the international honorary for professions in technology.

Editor & Publisher

Jerry Streichler

Board of Editors

Mark W. Bannatyne
Department of Technical Graphics
1419 Knoy Hall Room 363
Purdue University
West Lafayette, IN 47907-1419
765.494.7505
fax: 765.494.9267
mwbannatyne@tech.purdue.edu

Sharon Hart
North Dakota State College
of Science
800 6th St. North
Wahpeton, ND 58076-0002
701.671.2221
fax: 701.671.2145
sharon_hart@ndscs.nodak.edu

A.R. (Raj) Chowdhury
School of Technology
Kent State University
P.O. Box 5190
Kent, OH 44242-0001
330.672.2330
fax: 330.672.2334
raj@tech.kent.edu

Linda Rae Markert
200 Poucher Hall
State University of New York
at Oswego
Oswego, NY 13126-3599
315.341.5407
markert@oswego.edu

Charles Coddington
Dept. of Industrial Technology
East Carolina Univ.
103 Flanagan Hall
Greenville, NC 27858
252.328.1617
coddington@mail.ecu.edu

Christopher J. Shelley CMfgE
W. L. Gore & Associates
705 Guido Dr
Middletown, DE 19709
302.598.7289
cshelley@wlgore.com

David Devier
Industrial & Engineering
Technologies
Owens Community College
P.O. Box 10000
Toledo, OH 43699-1947
419.661.7459
fax: 419.661.7664
Ddevier@owens.cc.oh.us

Xeushu Song
Department of Technology
Northern Illinois University
Dekalb, IL 60115-2854
815.753.1349
fax: 815.753.3702
q20xxs1@corn.cso.niu.edu

Michael J. Dyrenfurth
Department of Industrial Technology
Purdue University
1410 Knoy Hall, Room 461
West Lafayette, IN 47907-1410
765.496.1203
fax: 765.494.0486
mjdyrenfurth@tech.purdue.edu

James Edwards
(representing the Board of Directors)

Staff for this Issue

Editorial Consultants

Nancy Hoose
Seth A. Streichler

Office Managers

Jerry C. Olson
Susan Pickens

Art & Layout Director

Jan Claybaugh

Board of Directors

Region 1 (The nations of Europe, the Eastern Provinces of Canada, and the Northeastern United States)

Kenneth P. DeLuca
Dept. of Industry and Technology
Millersville University of Pennsylvania
P.O. Box 1002
Millersville, PA 17551-0302
717.872.3868
fax: 717.872.3318
kenneth.delucca@millersville.edu

Region 2 (The nations of Africa, the Caribbean Islands and the Southeastern United States)

Robert E. Wenig
Department of Mathematics, Science, & Technology Education
Box 7801
North Carolina State University
Raleigh, NC 27695-7801
919.515.1742
fax: 919.515.6892
robert_wenig@ncsu.edu

Region 3 (All members-at-large, the Canadian Province of Ontario, and the North Central United States)

David Devier
Industrial & Engineering Technologies
Owens Community College
P.O. Box 10000
Toledo, OH 43699-1947
419.661.7459
fax: 419.661.7664
Ddevier@owens.cc.oh.us

Region 4 (The nations of Central and South America, the Northern Territory and Central Provinces of Canada, and the Central United States)

Lester Russell
1215 7th Street
Peru, NE 68421
402.872.5200
lr02240@alltel.net

Region 5 (Australia, the Island nations of the Pacific and Indian Oceans, the Nations of Asia, the Yukon Territory and Western Provinces of Canada, and the Western United States)

James Edwards
Department of Design & Industry
San Francisco State University
1600 Holloway Avenue
San Francisco, CA 94132
415.338.7896
fax: 415.338.7770
jge@sfsu.edu

Associate Executive Director for International Affairs

Michael J. Dyrenfurth
Dept. of Industrial Education & Technology
Iowa State Univ.
Ames, IA 50011-3130
515.294.0131
fax: 515.294.1123
mdyren@iastate.edu

Associate Executive Director for Community and Technical Colleges

Jerry C. Olson
Technology Building
Bowling Green State University
Bowling Green, Ohio 43403
419.372.0378
fax: 419.372.2800
jcolson@bgnnet.bgsu.edu

Executive Director

Jerry Streichler
Technology Building
Bowling Green State University
Bowling Green, Ohio 43403
419.372.0378
fax: 419.372.2800
jots@bgnnet.bgsu.edu

The Journal of Technology Studies (ISSN 1071-6084) is a publication of Epsilon Pi Tau, Incorporated, a nonprofit academic and professional honorary. Headquarters and editorial offices are located at the Technology Building, Bowling Green State University, Bowling Green, OH 43403-0305. This address or email to jots@bgnnet.bgsu.edu should be used for all author and editorial inquiries, and purchase of copies or subscriptions. Foreign subscriptions quoted on request. Rates subject to change without notice.

Copyright 2001 by Epsilon Pi Tau Inc.

The opinions expressed by the journal's authors are not necessarily those of the Board of Directors, staff or members of Epsilon Pi Tau.

The scope of interests in articles and in authors is as broad as the world of technology, with members of Epsilon Pi Tau receiving the same consideration as non-member contributors. Instructions for preparing and submitting manuscripts and a detailed description of the processes we follow in review and publication preparation are contained in the guidesheets reproduced in this issue as: "Guidelines for Authors" and "Editorial Review and Procedures." Submissions that fail to comply with these will not be reviewed and will not be returned to authors.

Two issues of the journal are published each year in on-line versions. At the end of the year, the two issues are combined and published in a hard copy volume that is provided to subscribers and to all members who, having paid their fees and dues for that calendar year, are in good standing.

The Journal is currently indexed in Current Index to Journals of Education and Australia's International Vocational Education and Training and Research Database. It is available on-line at three sites:

- <http://www.ncver.edu.au>
- <http://www.EpsilonPiTauHonorary.org>
- <http://scholar.lib.vt.edu/ejournals/JOTS/> (Virginia Tech's scholarly communications project).

Separate articles or complete issues are available on microform or hard copy from University Microfilm International, 300 North Zeeb Road, Ann Arbor, MI 48106.

Printed in the United States by Gray Printing Company, Fostoria, Ohio.