To
Dr. Abe Silverstein
whose pioneering work in liquid hydrogen technology paved the way to today's success —

KAMELSON von Belemn
9 November 1967
The Ohio Journal of Science
ISSN 0030-0950

Editorial Policy:

General:
The Ohio Journal of Science considers original contributions from members and non-members of the Academy in all fields of science. While special consideration will be given to manuscripts concerned with Ohio subject matter, other reports with scientific merit will be reviewed for publication. Submission of a manuscript is understood to mean that the work is original and unpublished, and is not being considered for publication elsewhere. All manuscripts considered for publication will be peer-reviewed. The opinions expressed by reviewers are their own, and do not represent the views of the Ohio Academy of Science or The Ohio Journal of Science.

Page Charges:
Publication in The Ohio Journal of Science requires authors to assist in meeting publication expenses. These costs will be assessed at $85 per page for members of the Academy and $120 per page for nonmembers. In multi-authored papers, each author must be a member of the Academy at the time of publication to be eligible for the reduced member rate. Papers that exceed 12 printed pages may be charged full production costs.

Submission:
Please submit duplicate copies of manuscripts and illustrations accompanied by a CD-ROM with a text file in MSWord and separate files of each illustration in tiff format in accord with current guidelines posted at http://www.ohiosci.org/ojsinstr.htm. Original photographs or transparencies and high resolution line art prints of maps or graphs are also acceptable. Additionally, as accessible from the guidelines web page, the following forms must be submitted with the manuscript: (1) affirmation of originality, (2) copyright transfer and (3) page charge acceptance.

Failure to Receive The Ohio Journal of Science:
Any claim of failure to receive subscription issues of The Ohio Journal of Science must be submitted to the Ohio Academy of Science within six months of date of issue of the missing number, to be recognized.

Listing Services:
The Ohio Journal of Science is listed or abstracted in several sources including:

- AcadSci Abstracts
- Bibliography of Agriculture
- Biological Abstracts
- Chemical Abstracts
- Current Advances in Ecological Sciences
- Current Contents (Agriculture, Biology & Environmental Sciences)
- Deep Sea Research and Oceanography Abstracts
- Environment Abstracts
- Environmental Information Center
- Forest Products Abstracts
- Forestry Abstracts
- Geo Abstracts
- GEOBASE
- Geology Abstracts
- GeoRef
- Helminthological Abstracts
- Horticulture Abstracts
- Nuclear Science Abstracts
- Review of Plant Pathology
- Selected Water Resources Abstracts
- World Agricultural Economics and Rural Sociology Abstracts

Date of issue — March 2007
Copyright © 2007 by The Ohio Academy of Science
Printing — CPMM, Columbus OH USA
CONTENTS

116th Annual Meeting

The Ohio Academy of Science

Hosted by

Cuyahoga Community College

Eastern Campus

Highland Hills, OH

April 20-21, 2007

Registration .................................................................2
Registration Form ........................................................35
Hotels and Restaurants ....................................................2
Campus Map ..................................................................58
Parking .......................................................................2
General Schedule ..........................................................2
Symposium ....................................................................6
All-Academy Lecture ....................................................2
Official Notice of Business Meeting .............................2
About Our Host ............................................................3

Indices of Peer-Reviewed Abstracts, Undergraduate Research in
Progress Summaries and Symposia Presenters:

All Technical Sessions ..................................................5
First Authors of Abstracts ..............................................32
Fields of Interest ..........................................................33

Cover photo: Courtesy of the National Aeronautics and Space Administration. Photo personally signed by the late Dr. Wernher von Braun (1912-1977) to commend then NASA Lewis Research Center Director, the late Dr. Abe Silverstein (1929-2001). The All-Academy Lecture this year, entitled Emerging Technologies that Support Space Exploration, is by Dr. Woodrow Whetlow Jr., the current Director of the National Aeronautics and Space Administration (NASA) John H. Glenn Research Center at Lewis Field in Cleveland, Ohio.