

Instron Tests the World's Composites



From QC sourcing of raw materials to evaluating advanced aeronautical materials, Instron is testing the world's composites. With Instron's complete composite systems: grips, fixtures, test instrument, and software, you can go from monotonic tension, flexure, shear, and compression testing to fracture toughness and fatigue evaluation.

Instron's complete composites testing package includes:

- Complete composite testing systems, grips, and composite fixtures such as IITRI, Iosipescu, short beam shear, etc.
- Flexible testing - tension, compression, fatigue, flexure, torsion
- Integrated software packages - Series IX and FLAPS
- High and low temperature testing equipment including extensometers, chambers and furnaces.



Instron Corp., 100 Royall Street, Canton, Mass. 02021 Phone (617)-828-2500.

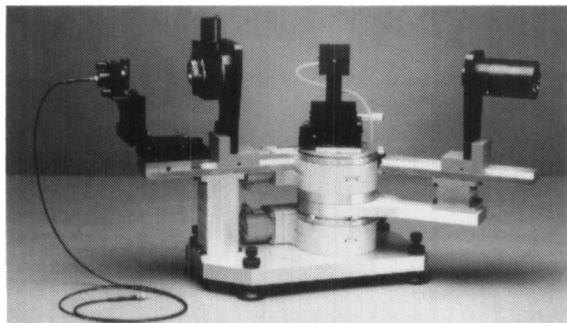
Circle No. 25 on Reader Service Card.

Advertisers in this issue

Academic Press	87
Advanced Materials Laboratory	72
AET addax	10
ASTeX	1
Axic	19
Bomem	58
Edmund Bühler	21
Cahn Instruments	6
Commonwealth Scientific	17
Digital Instruments	5
Elsevier	85, 89
EPI	8
Gem Dugout	72
GMW	66
High Voltage Engineering Europa B.V.	inside front cover
Huntington Laboratories	15
INSPEC	75
Instron	74
Janis Research	31
JEOL	inside back cover
LakeShore Cryotronics	28
Leybold Vacuum Products	84
MDC Vacuum Products	26
Mellen Co.	93
National Electrostatics	18
Oxford Applied Research	82
Perkin Elmer	2
Pergamon Press	80
Princeton Gamma-Tech	16
Quantum Design	9
UHV Instruments	back cover
Virginia Semiconductor	83
Voltaix	31
J.A. Woollam Co.	75

For free information about the products and services offered in this issue, mail the Reader Service Card, or FAX it to (312) 922-3165.

Automated Spectroscopic Ellipsometers - In situ, Ex situ, Modular -



- Menu Driven
Software for
Multilayer Analysis

- Sophisticated
Modeling
- 3-D Graphics



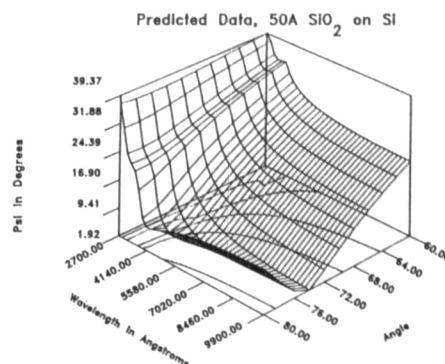
J.A. WOOLLAM CO.
-Research & Instrumentation-

650 J Street, Suite 39
Lincoln, NE 68508

PH: 402/477-7501
FAX: 402/477-8214

Circle No. 26 on Reader Service Card.

Measure:
- Multilayer Film Thicknesses
- Optical Constants
- Roughness, Void Fraction

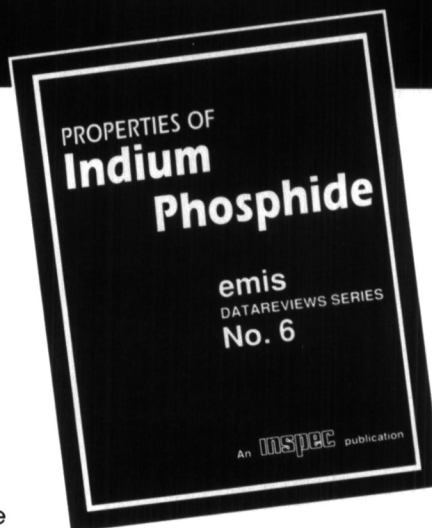


Properties of Indium Phosphide

\$250.00

This latest book in the EMIS Data-reviews Series from INSPEC is tailored to help those who study, process or use Indium Phosphide. It represents the coordinated expertise of 65 front-line researchers from Europe, the USA and Japan, and its 133 specialised surveys (Datareviews) provide a useful review and consolidation of R&D on this vitally important substance.

As well as covering the binary compound (InP) in depth, the book will include a comprehensive chapter on the compound alloy Indium Gallium Arsenide Phosphide, as well as chapters on:



- Basic Physical Properties
- Resistivity • Carrier Concentration and Ionization Rates • Electron Mobility, Diffusion and Lifetime
- Band Structure • Optical Functions • IR Absorption and Impurity Energy Levels • Photoluminescence, Raman and Reflection Spectra • Photoconductivity
- Defects, Deep Levels and Their Detection • Diffusion of Impurities • Surface Structure and Oxidation • Ion Implantation
- InGaAs and InGaAsP: Miscellaneous Properties • Exploitation of InP in Devices.

ISBN 0 85296 491 9, Casebound, 1991 425 pages, 280 x 210mm

inspec

IEEE Service Center, INSPEC Dept.
445 Hoes Lane, Piscataway, NJ 08855-1331
Phone: (908) 562-5553 Fax: (908) 981-0027

Circle No. 27 on Reader Service Card.

EQUIPMENT EXHIBIT

1991 MRS Spring Meeting

Anaheim Convention Center

Tuesday-Thursday, April 30 - May 2, 1991

As part of the 1991 Spring Meeting, a major equipment exhibit will display analytical and processing equipment closely paralleling the nature of the technical symposia. The exhibit will be in the Anaheim Convention Center, and the technical program has been arranged to allow meeting participants ample opportunity to visit the exhibit.

Show Hours

Tuesday	noon - 7:00 p.m.
Reception	5:00 p.m. - 7:00 p.m.
Wednesday	9:30 a.m. - 5:00 p.m.
Thursday	9:30 a.m. - 2:00 p.m.

1991 MRS SPRING SHOW EXHIBITORS AS OF FEBRUARY 6, 1991

<p>Academic Press, Inc. AET addax AG Associates Aixtron GmbH American Institute of Physics Anatech Ltd. APD Cryogenics Applied Science and Technology, Inc. (ASTeX) Atom Tech, Inc. Axic Inc. Cahn Instruments Cambridge Molecular Design Commonwealth Scientific Cookson Plasmaterials Cryomech Inc. CVC Products, Inc. Denton Vacuum, Inc. Diatome US Duniway Stockroom Corp. Elsevier Science Pub. Co. EMCORE Corporation EPI Charles Evans & Assoc. Extrel FTMS E. A. Fischione Instruments, Inc. Flexus Inc. Gatan GMW Associates</p>	<p>Granville-Phillips Co. High Vacuum Apparatus Mfg. High Voltage Engineering Europa B.V. Hologenix Inc. Huntington Mechanical Labs International Scientific Instruments Ion Tech, Inc. Janis Research Company JEOL U.S.A., Inc. Keithley Instruments Kevex/Fisons Instruments Kratos Analytical Lake Shore Cryotronics Lasertec U.S.A., Inc. Kurt J. Lesker Co. Link Analytical Luxtron Corporation, Accufiber Division MDC Vacuum Products Corporation MKS Instruments MMR Technologies Morris Research, Inc. National Electrostatics Corp. NESLAB Instruments Inc. NGS Associates, Inc. NOR-CAL Products, Inc.</p>	<p>Nordiko USA, Inc. North Eastern Analytical Oxford Applied Research Oxford Instruments N.A. Oxford Plasma Technology Peak Systems, Inc. Pergamon Press Perkin-Elmer Corp. Philips Electronic Instruments Plasma Sciences, Inc. Princeton Gamma-Tech Princeton Research Instruments, Inc. Quantum Design, Inc. Research Inc. Rocky Mountain Laboratories, Inc. S T A I B Instrumente South Bay Technology, Inc. Structure Probe, Inc./SPI Supplies Superior Vacuum Technology Surface/Interface, Inc. Tamarack Scientific Co., Inc. VG Instruments/Fisons Instruments Voltaix, Inc. XMR</p>
---	--	--

See ad in this issue.

Announcing:

1991 MRS Spring Meeting

Symposium Proceedings—

At pre-publication prices!



Place your order now for proceedings from the 1991 MRS Spring Meeting in Anaheim and you'll receive your books as soon as they are published. The special pre-publication prices listed are effective until July 1, 1991 only. After that, please call MRS at (412) 367-3012; FAX: (412) 367-4373 for prices.

To order: contact the Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15237 U.S.A.; phone (412) 367-3012; FAX (412) 367-4373. In Europe, Africa or the Middle East, order from: Clarke-Associates-Europe, Ltd., 13a Small Street, Bristol BS1 1DE, England, phone: 0272 268864; FAX: 0272 226437

Amorphous Silicon Technology — 1991

Editors: A. Madan, Y. Hamakawa, M. Thompson, P.C. Taylor, P.G. LeComber
ISBN 1-55899-113-1 Code: 219B
Special pre-publication prices:
\$48.00 MRS Members
\$57.00 U.S. List \$64.00 Foreign

Silicon Molecular Beam Epitaxy

Editors: J.C. Bean, E.H.C. Parker, S. Iyer, Y. Shiraki, E. Kasper, K. Wang
ISBN 1-55899-114-X Code: 220B
Special pre-publication prices:
\$43.00 MRS Members
\$52.00 U.S. List \$59.00 Foreign

Heteroepitaxy of Dissimilar Materials

Editors: J.P. Harbison, A. Zangwill, R.F.C. Farrow, P.S. Peercy
ISBN 1-55899-115-8 Code: 221B
Special pre-publication prices:
\$48.00 MRS Members
\$56.00 U.S. List \$63.00 Foreign

Atomic Layer Growth and Processing

Editors: T.F. Kuech, P.D. Dapkus, Y. Aoyagi
ISBN 1-55899-116-6 Code: 222B
Special pre-publication prices:
\$43.00 MRS Members
\$52.00 U.S. List \$59.00 Foreign

Low Energy Ion Beam and Plasma Modification of Materials

Editors: J.M.E. Harper, K. Miyake, J.R. McNeil, S.M. Gorbalkin
ISBN 1-55899-117-4 Code: 223B
Special pre-publication prices:
\$43.00 MRS Members
\$49.00 U.S. List \$56.00 Foreign

Rapid Thermal and Integrated Processing

Editors: M.L. Green, J.C. Gelpy, J. Wortman, R. Singh
ISBN 1-55899-118-2 Code: 224B
Special pre-publication prices:
\$45.00 MRS Members
\$53.00 U.S. List \$60.00 Foreign

Materials Reliability Issues in Microelectronics

Editors: J.R. Lloyd, P.S. Ho, C.T. Sah, F. Yost
ISBN 1-55899-119-0 Code: 225B
Special pre-publication prices:
\$40.00 MRS Members
\$47.00 U.S. List \$54.00 Foreign

Mechanical Behavior of Materials and Structures in Microelectronics

Editors: E. Suhir, R.C. Cammarata, D.D.L. Chung
ISBN 1-55899-120-4 Code: 226B
Special pre-publication prices:
\$40.00 MRS Members
\$49.00 U.S. List \$56.00 Foreign

High Temperature Polymers for Microelectronics

Editors: D.Y. Yoon, D.T. Grubb, I. Mita
ISBN 1-55899-121-2 Code: 227B
Special pre-publication prices:
\$43.00 MRS Members
\$52.00 U.S. List \$59.00 Foreign

Materials for Optical Information Processing

Editors: C. Warde, J. Stamatoff, W. Wang
ISBN 1-55899-122-0 Code: 228B
Special pre-publication prices:
\$38.00 MRS Members
\$47.00 U.S. List \$54.00 Foreign

Structure/Property Relationships for Metal/Metal Interfaces

Editors: A.D. Romig, D.E. Fowler, P.D. Bristowe
ISBN 1-55899-123-9 Code: 229B
Special pre-publication prices:
\$43.00 MRS Members
\$52.00 U.S. List \$59.00 Foreign

Phase Transformation Kinetics in Thin Films

Editors: M. Chen, M. Thompson, R. Schwarz, M. Libera
ISBN 1-55899-124-7 Code: 230B
Special pre-publication prices:
\$35.00 MRS Members
\$42.00 U.S. List \$49.00 Foreign

Magnetic Thin Films, Multilayers and Surfaces

Editor: S.S.P. Parkin
ISBN 1-55899-125-5 Code: 231B
Special pre-publication prices:
\$40.00 MRS Members
\$47.00 U.S. List \$54.00 Foreign

Magnetic Materials: Microstructure and Properties

Editors: T. Suzuki, Y. Sugita, B.M. Clemens, D.E. Laughlin, K. Ouchi
ISBN 1-55899-126-3 Code: 232B
Special pre-publication prices:
\$40.00 MRS Members
\$47.00 U.S. List \$54.00 Foreign

Synthesis/Characterization and Novel Applications of Molecular Sieve Materials

Editor: V.A. Maroni
ISBN 1-55899-127-1 Code: 233B
Special pre-publication prices:
\$40.00 MRS Members
\$47.00 U.S. List \$54.00 Foreign

Modern Perspectives on Thermoelectrics and Related Materials

Editors: D.D. Allred, G. Slack, C. Vining
ISBN 1-55899-128-X Code: 234B
Special pre-publication prices:
\$42.00 MRS Members
\$52.00 U.S. List \$59.00 Foreign

Please visit Booth No. 203 at the MRS Show in Anaheim, CA, April 30-May 2, 1991.

13 Correctly "Figure This" in JMR Contest

With publication this past November of the second JMR "Figure This" Contest, materials scientists got to test their knowledge of a wide range of interdisciplinary research.

The 1990 JMR "Figure This" Contest, like the original version two years earlier, was a materials research "quiz" designed to focus attention on the growth and success of *Journal of Materials Research*.

Borrowing diagrams and micrographs which have appeared in the Journal since its debut in January 1986, the contest invited scientists and engineers to correctly match eight figures with what were evidently some *very* difficult captions. Many people stopped by the JMR desk at the 1990 MRS Fall Meeting to report that they were having trouble choosing the correct captions. Others, seeing the contest in *Physics Today*, *Ceramic Bulletin* and the *MRS Bulletin*, submitted entries with one or more incorrect answers.

The objective of the contest was to let the eight figures reflect a wide array of research interests and materials which have been reported in *Journal of Materials Research*. While by no means exhaustive, this collection of materials "art" seems to have achieved that goal fairly well. In all, 101 people submitted completed entries; only 13 correctly matched all eight figures with captions.

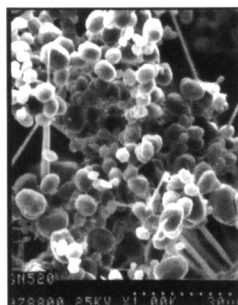
Contestants were offered an MRS book of their choice if they correctly identified all the figures.

JMR "Figure This" Contest Winners

Janet M. Bonar
Chris A. Ebbers
Gautam Ghosh
Jane Horrigan
Kalyan Kumar Karmakar
David Lange
Hua Li
Shoudeng Liang
Stanley Wu-Wei Liu
Ross Plovnick
Deborah A. Summa
D.J. Werder
Wei Zhu

Journal of MATERIALS RESEARCH

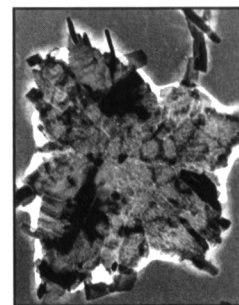
"Figure This" Contest



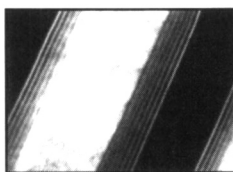
1.



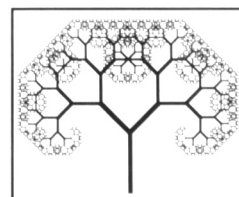
2.



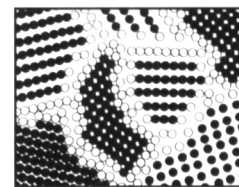
3.



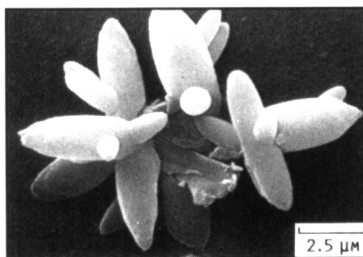
4.



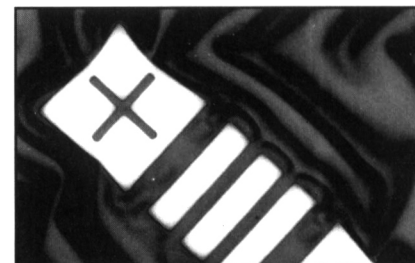
5.



6.



7.



8.

Thanks to everyone who participated. There is talk of having another JMR contest. To prepare you for that possibility, we want to give you a chance now, in case you missed it before, to try the quiz for yourself. Match the figures with correct captions. Good luck! The answers are on the Book Reviews page.

The captions:

- | | |
|---------------------------------|--------------------------------------|
| a. Twins in lateral silicon epi | i. Nanophase material |
| b. Anatase in titania | j. Displacement cascades |
| c. Polycrystalline diamond | k. Bariumaluminosilicate |
| d. Fractal dendrites | l. Stress distortion in stencil mask |
| e. Sulfur flowers | m. Fe precipitates on silica |
| f. Silicate birds | n. Twins in YBaCuZnO |
| g. Silicon nitride crystallites | o. Resist pattern reticulation |
| h. Holes in alumina | p. Overlapping thermal spikes |