

CALENDAR

Information in the calendar is compiled from a file maintained in the PHYSICS TODAY editorial offices. The date at the end of each item refers to the issue of PHYSICS TODAY in which the item is first listed with more detail than appears in subsequent issues. Readers are invited to write or telephone for additional information.

- new listing ♦ new information

January 1967

25-27 American Crystallographic Association (Atlanta) *PT Dec. 1966*

25-28 • Thermal Neutron Scattering Applied to Chemical and Solid-State Physics (Atlanta) *PT Jan. 1967*

The American Crystallographic Association will hold this symposium in conjunction with its winter meeting at the Georgia Institute of Technology. Six invited papers reviewing recent developments in the field of inelastic and magnetic scattering of thermal neutrons will be presented. The meeting will also be addressed by Sir Lawrence Bragg, The Royal Institution; P. P. Ewald, Polytechnic Institute of Brooklyn and R. P. Ozierov, Karpov Institute of Physical Chemistry.

Contact: R. A. Young, Engineering Experimental Station, Georgia Institute of Technology, Atlanta, Ga.

30-32 American Physical Society (New York City) *PT Dec. 1966*

30-32 American Association of Physics Teachers (New York City) *PT Dec. 1966*

February 1967

2,3 Western Spectroscopy Association (Pacific Grove, Calif.) *PT Dec. 1966*

3,4 The Surface of Mars (New York City) *PT Dec. 1966*

6-8 ♦ Society of Rheology (Santa Barbara) *PT Jan. 1967*

Contact: M. C. Shen, North American Aviation Science Center, 1049 Camino Dos Rios, Thousand Oaks, Calif. 91360

14-19 Triplet State (Beirut) *PT Dec. 1966*

22,23 Neutron Scattering and Energy Band Theory for Metals and Alloys (U. of Illinois) *PT Dec. 1966*

22-24 Biophysical Society (Houston) *PT Dec. 1966*

23,24 Louisiana Society for Electron Microscopy (New Orleans) *PT Dec. 1966*

23-25 American Physical Society (Austin, Tex.) *PT Dec. 1966*

26-11 Special Problems in High Energy Physics (Schladming, Austria) *PT Dec. 1966*

March 1967

1-3 Accelerator Engineering and Technology (Washington, D.C.) *PT Dec. 1966*

2-4 • Experimental Nuclear Magnetic Resonance (Mellon Institute, Pittsburgh) *PT Jan. 1967*

Contact: B. L. Shapiro, Chemistry Department, Illinois Institute of Technology, Chicago, Ill. 60616

2-10 Radioactive Dating and Methods of Low-Level Counting (Vienna) *PT Dec. 1966*

6, 7 Rheology of Solids (Boston) *PT Dec. 1966*

6-10 Applications of Modern Mathematics (U. of California, Los Angeles) *PT Dec. 1966*

13-17 Plutonium as a Reactor Fuel (Brussels) *PT Dec. 1966*

13-24 Multiregion Boundary Value Problems: Computer and Analytical Methods with Applications (U. of California, Los Angeles) *Pt Dec. 1966*

14,15 • Temperature Measurements (Los Angeles) *PT Jan. 1967*

Sponsor: Temperature Measurements Society. Contact: R. A. Finch, Atomics International, PO Box 309, Canoga Park, Calif. 91304

17,18 • Behavior at Surfaces (Hartford) *PT Jan. 1967*

INSTRUMENTATION FOR RESEARCH

— PHYSICISTS

— ELECTRONIC ENGINEERS

— PHYSICAL CHEMISTS

Princeton Applied Research has openings in its Research and Development Department for physicists, engineers and chemists who are interested in developing instruments embodying new concepts in the fields of signal processing, geophysics, analytical chemistry, medicine, optics, spectroscopy, cryogenics and solid state. PAR is engaged in the application of modern scientific techniques to the design of superior instruments useful in wide fields of experimental research. The atmosphere and working conditions are excellent, the problems challenging and stimulating, the staff alert and competent.

Send resume or call collect:

Dr. Thomas Coor

Director, Research & Development

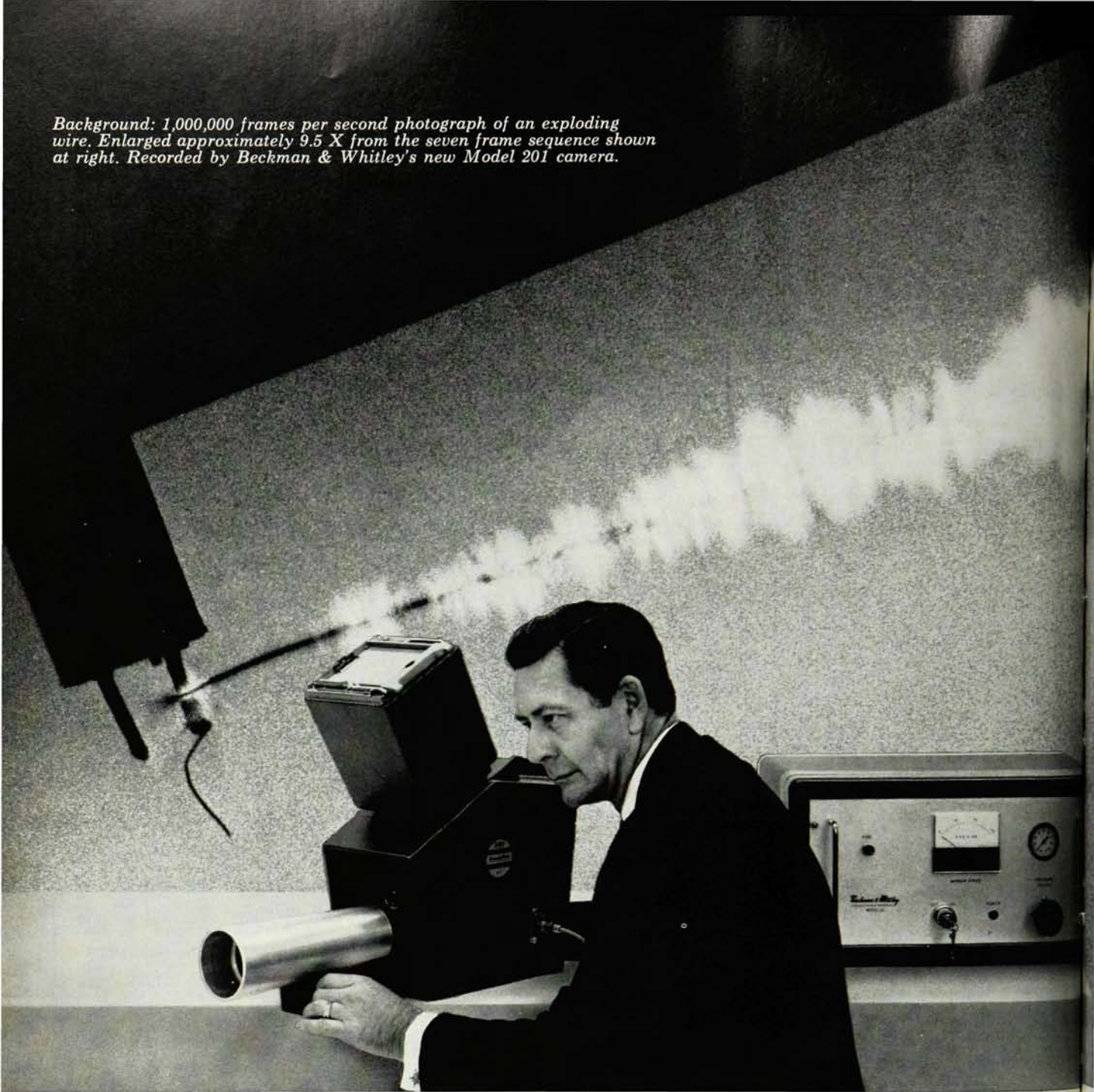
Princeton Applied Research Corporation

P. O. Box 565

Princeton, New Jersey 08540

(609) 924-6835

Background: 1,000,000 frames per second photograph of an exploding wire. Enlarged approximately 9.5 X from the seven frame sequence shown at right. Recorded by Beckman & Whitley's new Model 201 camera.



\$11,950 puts your lab into ultra high speed.

This new camera is the first high performance ultra fast research camera available anywhere at moderate cost. The Beckman & Whitley Model 201 camera records seven high resolution pictures at rates from 30,000 to 1,000,000 pictures per second. For comparable quality and framing rate you would formerly have paid nearly twice the price.

Now most research laboratories can afford ultra high speed photography. The Model 201 is designed for applications such as the study of shock and vibration, dynamic stress propagation, plasmas, arc discharges, exploding wires, detonations, nucleation, mechanical motion and hypervelocity impact.

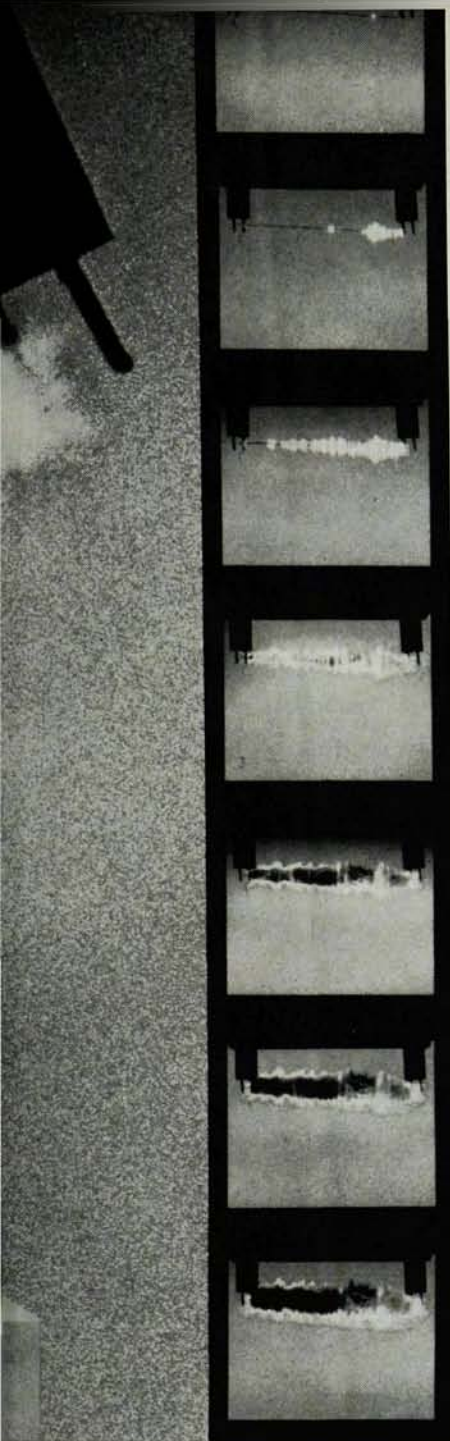
Model 201 is compact, portable and includes all components required to record high speed events:

camera, framing module, objective lens and controls. Add-on framing modules are available which extend the framing rate to 1,960,000 pictures per second.

Model 201 is the newest from Beckman & Whitley, manufacturers of almost all cameras used throughout the world that record at rates above 10,000 pictures per second. It incorporates the most advanced state-of-the-art optical and mechanical design features.

If you would like further information, or if you and your staff would like a demonstration in your laboratory, just send in the coupon at right.

Beckman & Whitley
A SUBSIDIARY OF TECHNICAL OPERATIONS, INC.



beckman & Whitley, Inc., 441 Whisman Rd., Mountain View, Calif. 94040, Phone (415) 68-6220. Europe: Kettingweg 23, Baarn, Holland, Telephone 5004.

☐ Please send me a Model 201 Camera brochure and price list.
☐ Please have a sales engineer contact me. I would like further information or a Model 201 demonstration in my laboratory.

NAME _____
 TITLE _____
 COMPANY _____
 ADDRESS _____
 CITY _____
 STATE _____ ZIP _____

A joint meeting of the Connecticut Valley Section of the American Chemical Society and the New England Section of the American Physical Society will be sponsored by Trinity College and the United Aircraft Research Laboratories in Hartford, beginning on the afternoon of Friday, the 17th and extending through Saturday. The Friday session will consist of a tour of the United Aircraft laboratories and technical presentations, followed by a ceremonial dinner featuring a talk by Isaac Asimov of the Boston University medical school. Saturday morning will be devoted to contributed papers from members of both societies; the afternoon program will be a three-speaker tutorial on surfaces.

Contact: David M. Wetstone, United Aircraft Research Laboratories, East Hartford, Conn. 06108.

17-21 National Science Teachers Association (Detroit) *PT Dec. 1966*

20 • Field-Ion Microscopy (U. of Cambridge) *PT Jan. 1967*

Sponsor: The Institute of Physics and The Physical Society. Abstracts deadline: 10 Feb. Contact: Meetings Officer, The Institute of Physics and The Physical Society, 47 Belgrave Square, London, SW 1, England

20-22 Physical Processes in the Lower Atmosphere (Ann Arbor) *PT Dec. 1966*

20-22 • Physical Electronics (Massachusetts Institute of Technology) *PT Jan. 1967*

An American Physical Society Topical Conference, the meeting is soliciting papers on basic phenomena and processes associated with the behavior of electrons in solids, liquids and gases, and at the gas-surface interface. The abstracts deadline is 13 Feb.

Contact: R. E. Stickney, Room 3-350, Massachusetts Institute of Technology, Cambridge 39, Mass.

21-25 • Continental Drift, the Motion of the Pole, and the Rotation of the Earth (Stresa, Italy) *PT Jan. 1967*

Sponsor: International Astronomical Union, International Union of Geodesy and Geophysics. *By invitation.* Contact: W. Markowitz, Physics Department, Marquette University, Milwaukee, Wis. 53233

22-24 Modern Optics (New York City) *PT Dec. 1966*

23-25 Nucleon-Nucleon Interaction (Gainesville) *PT Dec. 1966*

27-30 American Physical Society (Chicago) *PT Dec. 1966*

27-30 • APS Division of Solid-State Physics (Chicago) *PT Jan. 1967*

Contact: W. V. Smith, IBM Research Center, PO Box 218, Yorktown Heights, N.Y. 10598

27-30 APS Division of High-Polymer Physics (Chicago) *PT Dec. 1966*

28-30 Engineering Aspects of Magneto-hydrodynamics (Stanford U.) *PT Dec. 1966*

30-31 Transport Properties of Superconductors (University of Kent) *PT Dec. 1966*

31-11 Energetics and Mechanisms in Radiation Biology (Portmerion, Wales) *PT Dec. 1966*

April 1967

3-5 Thin Films (Nottingham) *PT Dec. 1966*

3-5 • Solid State Chemistry (Brown U.) *PT Dec. 1966*

5-7 Spark Discharges (U. of Liverpool) *PT Dec. 1966*

5-7 Intermag (Washington, D.C.) *PT Dec. 1966*

8-13 • Stereology (Chicago) *PT Jan. 1967*

Sponsor: International Society for Stereology. Contact: H. Elias, 2020 West Ogden Avenue, Chicago, Ill. 60612

12-13 Point Defects in Metals (Reading, England) *PT Dec. 1966*

12-14 Shock Tubes (Freiburg, W. Germany) *PT Dec. 1966*

12-14 • The Teaching of Mathematics to Physicists (U. of Exeter) *PT Jan. 1967*

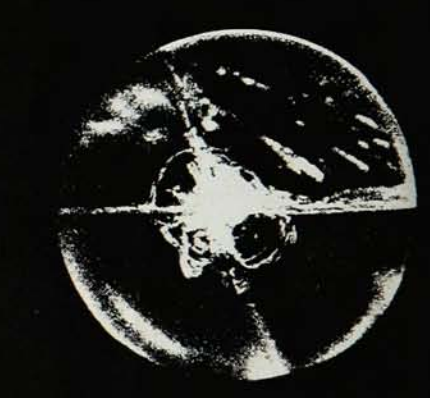
Jointly sponsored by The Institute of Physics and The Physical Society, the meeting will consist of two invited talks per session followed by discussion from the floor. A proposed agenda includes the nature of mathematics, the role of mathematics in physics, descriptions of the Southampton and Midlands mathematics projects, the conflict between pure and applied in school mathematics, mathematics in undergraduate physics and mathematics in university physics.

Contact: Meetings Officer, The Institute of Physics and The Physical Society, 47 Belgrave Square, London, SW 1, England.

12-14 Optical Society of America (Columbus, Ohio) *PT Dec. 1966*

14,15 AAPT Central Pennsylvania Section (Huntingdon) *PT Dec. 1966*

14,15 APS Ohio Section (Columbus)



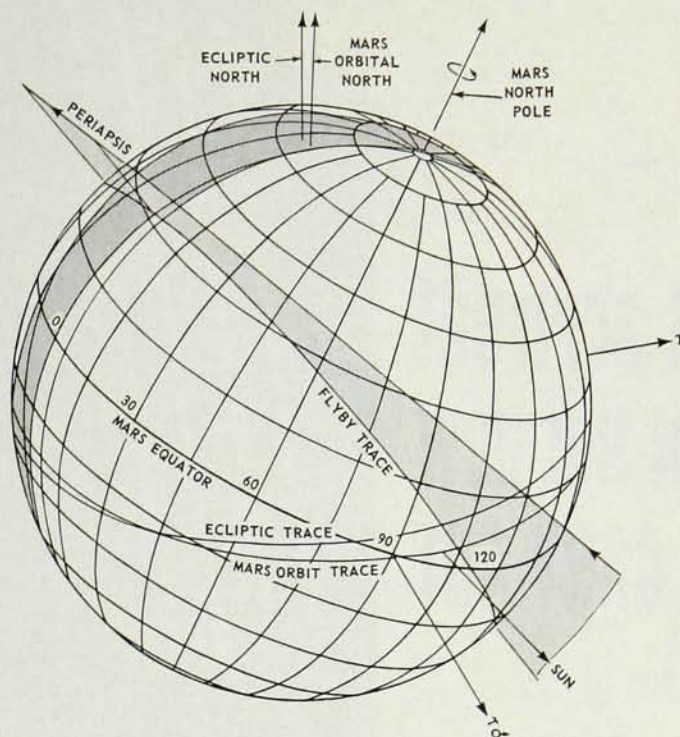
Lincoln Laboratory, an electronics research center of the Massachusetts Institute of Technology, conducts theoretical and experimental studies in selected areas, with responsibility for applications to problems of national defense and space exploration. The *Solid State* research and development program is concerned with quantum electronics, lasers, optical and infrared devices, solid state spectroscopy, semiconductor physics, computer components, and materials investigations. All qualified applicants will receive consideration for employment without regard to race, creed, color or national origin. Lincoln Laboratory, M.I.T., Box 15, Lexington, Massachusetts 02173.

Solid State Physics
Information Processing
Radio Physics and Astronomy
Radar
Computer Applications
Space Surveillance Techniques
Re-entry Physics
Space Communications
A description of the Laboratory's work will be sent upon request.

- 17-19 **Elementary Particles** (London)
PT Dec. 1966
- 17-19 **Nondestructive Evaluation of Aerospace and Weapons Systems Components and Materials** (San Antonio) *PT Dec. 1966*
- 17-19 **Thermal Balance of Spacecraft** (New Orleans) *PT Dec. 1966*
- 19-22 **Acoustical Society of America** (New York City) *PT Dec. 1966*
- 19-22 **Semiconductor Device Research** (Bad Nauheim, West Germany)
PT Dec. 1966
- 22 • **American Association of Physics Teachers Iowa section** (Drake U., Des Moines) *PT Jan. 1967*
Contact: G. W. Bowen, Iowa State U., Ames, Iowa
- 24-26 • **Frequency Control** (Atlantic City) *PT Jan. 1967*
Sponsor: US Army Electronics Command. Contact: Director, Electronics Components Laboratory, US Army Electronics Command, Attention: AMSEL-KL-ST (M. F. Timm), Fort Monmouth, N.J. 07703
- 24-26 **Image Detection and Processing** (Royal Radar Establishment, Great Malvern) *PT Jan. 1967*
Sponsor: The Institute of Physics and The Physical Society. Abstracts deadline 1 Feb. Contact: Meetings Officer, The Institute of Physics and The Physical Society, 47 Belgrave Square, London, SW 1, England
- 24-27 **American Physical Society** (Washington, D.C.) *PT Dec. 1966*
- 28,29 **Physics of Superconducting Devices** (U. of Virginia) *PT Jan. 1967*
Sponsor: Office of Naval Research. Contact: B. S. Deaver Jr, U. of Virginia, Physics Department, Charlottesville, Va. 22903

May 1967

- 3-6 **Rare Earths** (Gatlinburg) *PT Dec. 1966*
- 5-6 **Interaction of Light with Matter** (Webster, N.Y.) *PT Dec. 1966*
- 8-10 **Origin and Distribution of the Elements** (Paris) *PT Dec. 1966*
- 8-10 **High Temperature Chemistry** (Argonne National Lab) *PT Dec. 1966*
- 8-10 **Fluidics** (Washington, D.C.) *PT Dec. 1966*
- 8-10 **Microwave Theory and Technique** (Boston) *PT Dec. 1966*
- 15-18 **Spectroscopy** (Chicago) *PT Dec. 1966*



Exploration of Mars

This flyby trajectory is one of many now being investigated at Bellcomm for NASA's Office of Manned Space Flight.

The spacecraft passes overhead from east to west and reaches a latitude of about 40° N. just before passing the periapsis or point of closest approach. Periapsis passage takes place about 20 minutes before dawn on a spring day on Mars. These details substantially influence the design of probes that are being deployed from the spacecraft as it approaches Mars.

Where must a probe impact the Martian surface an hour before periapsis passage, if the spacecraft is to pass directly over the impact site? How long can line-of-sight contact be made with the probe? How far from Mars will the spacecraft be when line-of-sight contact is re-established?

Bellcomm invites you to help provide some of the answers. There are immediate openings for qualified specialists in all technical disciplines bearing on analysis of planetary missions—flight mechanics, guidance and navigation, communications, bioastronautics, propulsion and power systems. We also are in need of aeronautical and mechanical engineers broadly experienced in vehicle systems or mission planning.

If you feel you are qualified, send your résumé to Mr. N. W. Smusyn, Personnel Director, Bellcomm, Inc., Room 1500-J, 1100 17th St., N.W., Washington, D.C. 20036. Bellcomm is an equal opportunity employer.



Bellcomm, Inc.
A Bell System Company

Just arrived! Meet the new CARY 401



THE ALL SOLID STATE VIBRATING REED ELECTROMETER... WITH THE "EXTRAS" BUILT IN

It's compact and improved. So compact you can carry it in an overnight bag. But when it comes to capability, the CARY 401's a giant.

For example, there are a dozen different built-ins. All formerly optional. On the CARY 401 they're standard. Including multiple input resistor switching, remote input shorting, critical damping, grounded voltage modification, and master-slave operation.

What's more, we've added some brand new features. Like a battery power mode that provides portability and takes over if line power fails. Even removable rack mounting brackets.

Sensitivity? Excellent. The CARY 401 detects currents less than 10^{-17} ampere, charges as small as 5×10^{-16} coulomb, potentials down to 2×10^{-5} volt and resistances as high as 10^{16} ohms.

There's extra reliability too. That's because the CARY 401 is solid state. All of it. Including the input stage. That means high operational reliability, longer instrument life and no microphonic problems.

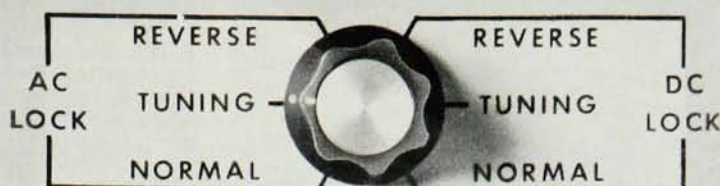
This remarkably versatile electrometer permits you to do almost any job you wish. Want more details? Call CARY for a demonstration of what's in the suitcase, or write for Data File P611-17.

CARY®

instruments • a varian subsidiary
2724 South Peck Road, Monrovia, Calif. 91016

UV/VIS/IR/Raman Recording Spectrophotometers
Manual Spectrophotometers • Spectropolarimeters
Vibrating Reed Electrometers & Amplifiers

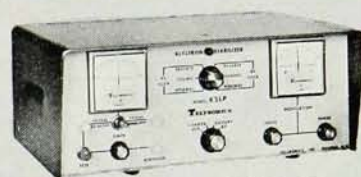
KLYSTRON AFC



AUTOMATIC CLOSED LOOP FREQUENCY STABILIZATION of a wide variety of klystron oscillators is economically and simply provided by the Teltronics Klystron Stabilizer (Model KSLP). The solid-state unit operates on either AC or self-contained batteries. There's not much more you need to know about the KSLP except the mode in which you desire to operate it.

A synchronous detection system locks your klystron to an external reference cavity frequency in AC Lock Mode

and to an external Pound-type modulated microwave discriminator reference cavity in DC Lock Mode. It provides a built-in test feature for the stabilizer circuit, 3000 volt insulation and a 40 volt reflector voltage range in a standard or rack-mounted cabinet. Complete specifications will be sent by return mail.



\$889.00

Subsidiary of Roanwell Corporation
23 Main Street, Nashua, New Hampshire 03060
603-889-6694

Teltronics, Inc.

PHYSICISTS ENGINEERS MATHEMATICIANS

Engineering-Physics Company, founded in 1960, is now growing into new fields of research and development. Singular opportunity exists for scientists and engineers who have the resourcefulness, imagination, and technical background to assume a responsible role.

Project emphasis is in:

**Instrument Development
Electromagnetics
Mechanics
Magnetohydrodynamics
Shock Hydrodynamics**

*Address inquiries to
Robert M. Kimzey, Jr.*

**ENGINEERING-
PHYSICS
COMPANY**

12721 Twinbrook Parkway
Rockville, Maryland 20852
(Suburban Washington, D.C.)

An equal opportunity employer.

WRITE FOR OUR LATEST CATALOG 21

**COMPONENTS and INSTRUMENTS
for OPTICAL RESEARCH**

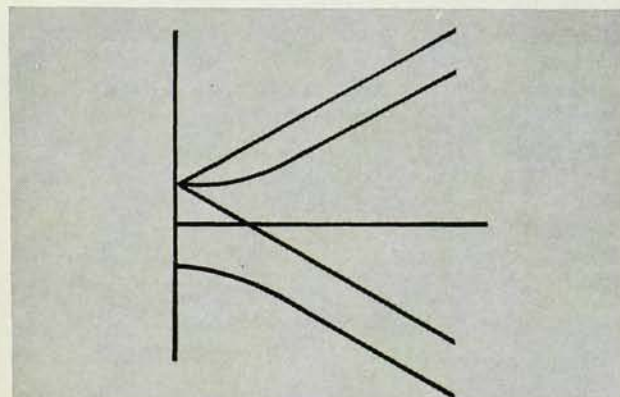
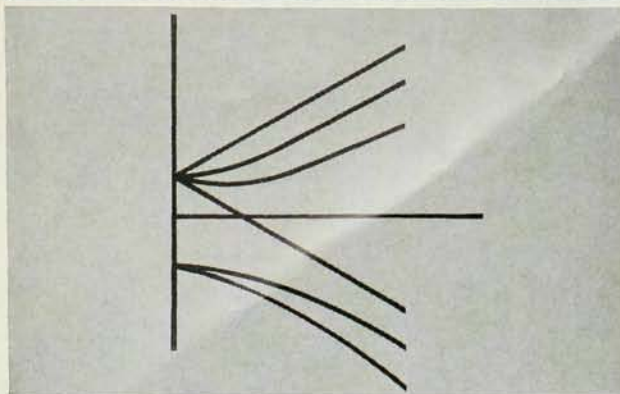
**LASER COMPONENTS • QUARTZ LENSES
MIRRORS • U. V. NEUTRAL DENSITY FILTERS
INTERFERENCE FILTERS**

**XENON AND MERCURY ARC SOURCES
SPECTRAL LAMPS • MONOCHROMATORS
PHOTOMULTIPLIER ACCESSORIES**

SEE US AT THE A. P. S. BOOTH 174



**ORIEL
OPTICS
CORPORATION**
322 MAIN ST.,
STAMFORD, CONN. 06901,
Tel.: 203-325-2279



POLARIZED ION SOURCE

■ This source utilizes the Abridged-Winter weak field adiabatic passage method developed at CEN, Saclay, and yields the highest intensity atomic beam with the greatest polarization presently available from a polarized ion source. It also contains provision for independent, rapid and automatic switching of the vector and tensor polarization states without change in beam intensity.

SPECIFICATIONS

POSITIVE IONS

Currents	Protons	Deuterons
Guaranteed	1.0 microampere	1.0 microampere
Design Aim	3.0 microamperes	3.0 microamperes

Polarization

Measured		
Pure Vector	$\pm 80\%$	$\pm 60\%$
Pure Tensor		$\pm 90\%$
Theoretical Maximum Possible		
Pure Vector	$\pm 100\%$	$\pm 67\%$
Pure Tensor		$\pm 100\%$

(Automatic switching between polarization states at 50 kcs rate.)

Quantization Axis Direction	Parallel or perpendicular to beam axis
Beam Energy	To 10 keV or higher

NEGATIVE IONS

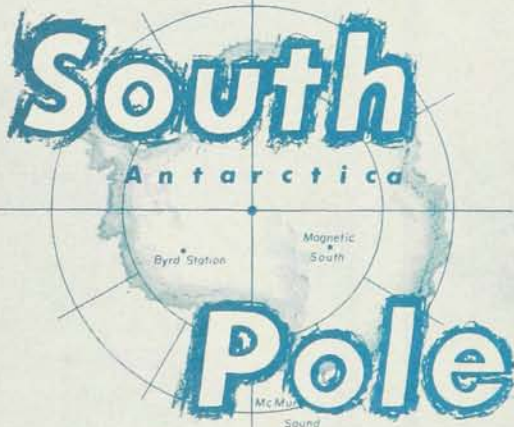
Currents	Protons	Deuterons
Guaranteed	.005 microampere	.005 microampere
Design Aim	.250 microampere	.250 microampere

All other properties are the same as for positive ions.

For more information, please write or call:

THE CYCLOTRON CORPORATION

Dept. SRS 950 Gilman Street, Berkeley, California 94710, 415/524-8670



Resumés are invited now for the
1967-68

ANTARCTIC RESEARCH PROGRAM

Competent, self-reliant physicists and electronic engineers are needed to work in the **HIGH LATITUDE UPPER ATMOSPHERIC PHYSICS PROGRAMS.**

OPERATIONAL AREA...

Byrd Station and South Pole Station, Antarctica.

SCOPE... Special training at Boulder, Colo. - July thru October, followed by 12 months at the operational stations, with data collection and analysis the main scientific effort.



Sledge teams, oldest form of polar travel, proved invaluable in early antarctic expeditions. Today, modern carriers such as planes and tractors supply scientists from more than a dozen nations as they pool knowledge and resources in an effort to blaze new trails in discovery.....

RESEARCH MEDIA... Vertical Incidence Soundings, Riometry, Micropulsations, Airglow and Auroral studies.

Contact Personnel Officer

Environmental Science Services Administration
Boulder, Colorado

80302

an equal opportunity employer.



ogy and Medicine, Atomic Energy Commission, Washington, D.C.

18-23 Kinetics of Reactions in Ionic Systems (Alfred, N.Y.) *PT Dec. 1966*

19 (through 25 Aug.) Theoretical Physics (U. of Colorado) *PT Dec. 1966*

19-23 Colloquium Spectroscopicum Internationale (Carleton U., Ottawa) *PT Dec. 1966*

19-23 • Phase Transitions of the Second Kind (Cleveland) *PT Jan. 1967*

Contact: J. G. Adler, Physics Department, Western University, Cleveland, Ohio 44106

19-23 • Carbon (Buffalo) *PT Jan. 1967*

Sponsor: American Carbon Committee. Abstracts deadline: 1 Feb. Contacts: S. Mrozowski, Carbon Research Laboratory, State University of New York at Buffalo, Buffalo, N.Y. (abstracts); D. A. Cadenhead, Acheson Hall, State University of New York at Buffalo (local arrangements).

19-28 Physics of the Magnetosphere (Boston College, Massachusetts) *PT Dec. 1966*

21-23 American Physical Society (Toronto) *PT Dec. 1966*

27-2 Thin Films (Budapest) *PT Dec. 1966*

July 1967

3-5 • Electron Diffraction (London) *PT Jan. 1967*

Britain's Institute of Physics and Physical Society will celebrate the 40th anniversary of the discovery of electron diffraction with a conference at Imperial College in London. The meeting, also supported by the International Union of Crystallography, will review the status of structure analysis, dynamical theory, energy losses, low-energy electron diffraction, experimental techniques and applications. Two-hundred-word abstracts on the above must be sent by 28 April to M. Blackman, Imperial College, London, SW 7.

Contact: Meetings Officer, The Institute of Physics and The Physical Society, 47 Belgrave Square, London, SW 1, England.

4 (through 25 Aug.) Many-Body Physics (Les Houches, France) *PT Dec. 1966*

16 ♦ (through 31 Aug.) Battelle Seattle Rencontres in Mathematics and Physics (Seattle) *PT Jan. 1967*

Contact: C. M. DeWitt, Physics Department, U. of North Carolina, Chapel Hill, N.C. 27514 or J. A. Wheeler, Palmer Physical Laboratory, Princeton U., Princeton, N.J.

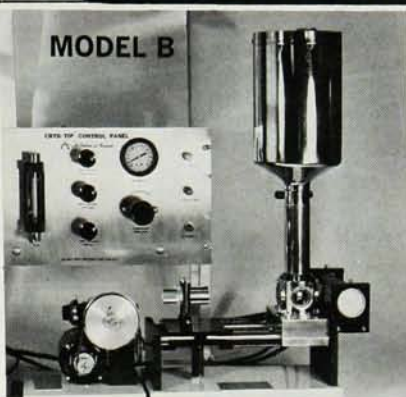
Newest member of the Spectroscopy Family

**SO
NEW**



**MÖSSBAUER EFFECT
ANALYZERS**

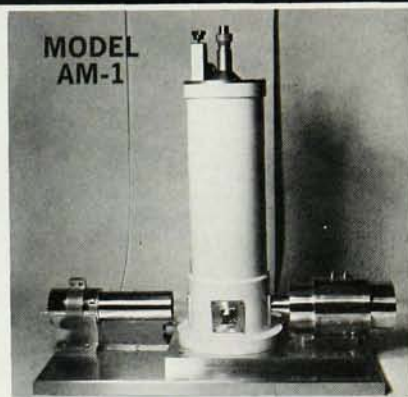
...ALL THE APPLICATIONS HAVEN'T BEEN EXPLORED!



A research quality instrument, providing semi-automatic data collection, for use in routine laboratory experiments or non-routine research.

Constant velocity, 0 to 15mm/sec.

Optional source or absorber cooling variable 16° to 70° K also available.



Velocity range 0-15 and 0-60 cm/sec, continuously variable.

Source and/or absorber cooling to liquid helium temperature.

Automatic data collection. Full spectrum display. $\pm 1\%$ system linearity over 95% of the half period of the velocity waveform.

Write for our free Applications Bulletin on Mossbauer Spectroscopy

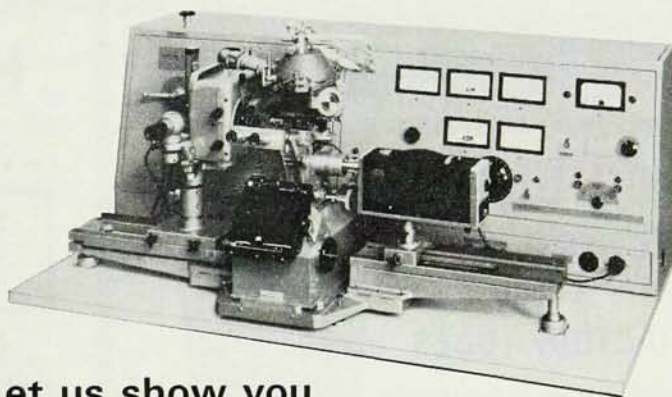


Nuclear Science & Engineering Corporation

P.O. Box 10901 • Pittsburgh, Pa. 15236

Area Code 412 462-4000

Visit us in Booth 131



**Let us show you
what high temperature
metallography can do for you**

Request literature and demonstration of the "VACUTHERMAT" High Temperature Microscopy Installation featuring:

Rapid High Vacuum
Low Thermal Inertia
Temperatures to 1800°C
Precise Temperature and Atmospheric Control
High Resolution with Continuous Image Clarity

For use with all Reichert metallographs and most inverted microscopes of other makes.

William J. Hacker & Co., Inc.
Box 646, W. Caldwell, N. J. 07006
(201) 226-8450

Hacker