

chanical workshops have 300 people, electronics has 100, vacuum has 20, tube technology has 70 and glass technology has 75. When we visited the glass and tube shops of Wim Luiten, we were impressed by their size and scope.

Research. On our tour of the labs, Volger first took us to see Gerard A. Acket, who has been working on gallium aluminum arsenide heterojunctions. His group is investigating the properties of p-type gallium arsenide regions, the regions in which lasing takes place. In one such experiment, they have applied pulsed helium-neon radiation to the heterojunction and studied the kinetics of recombination radiation.

Teun J. B. Swanenburg and Joachim Wolter have been studying the transmission of high-frequency phonons through an interface between solid and liquid helium (*Phys. Rev. Lett.* 31, 693, 1973). By means of a heat-pulse experiment at 1.3 K they showed that the conversion of ballistic phonons in a solid into second sound in superfluid helium can be used to study the transmission coefficient of the phonons through the interface. Unexpectedly, they found that the transmission coefficient for longitudinal and transverse phonons in silicon were equal for heater temperatures between 10 and 20 K. They are now planning to investigate if there is a critical cone when phonons strike the interface, as had been predicted theoretically.

Tony van Oostrom told us about work at Philips on field-ion microscopy. In his pioneering work, Erwin Muller had used primarily helium, but also some hydrogen. Helium requires a very high electric field to be applied, which may cause field evaporation of the sample being used as a tip. So one was limited to high melting-point materials with a high yield strength such as tungsten, rhenium and platinum. The problem with hydrogen is that it will etch in a high field, van Oostrom told us; so it will not produce a very stable image, although it requires a much lower electric field.

If one tries to image a sample at lower field strength with a gas such as argon, the fluorescent yield from the screen is low. To solve this brightness problem, Philips workers introduced channel plates into the microscope; these are discs made of glass, covered on both sides with a thin metallic conductor. The metal layer and the disc are perforated by thousands of micro-channels, the channel surface being made conducting by a reduction process. When a high voltage is applied, the channels act as an image intensifi-

er by producing an avalanche of secondary electrons for each electron entering a channel. This technique allows one to reduce exposure times, van Oostrom told us, to use other image gases, and to investigate other materials. It also allows the application of color superposition techniques to observe small changes in the field-ion image.

Intermetallic compounds can be used to store and purify hydrogen, according to Hinne Zijlstra. He found that compounds of a rare earth and nickel or cobalt, such as LaNi_5 , by the incorporation of at least six atoms of hydrogen per unit LaNi_5 , form a hydride. When such a nickel compound is brought into contact with hydrogen that has a pressure slightly above the equilibrium pressure, the compound absorbs the hydrogen. If the pressure is lowered below the equilibrium pressure, the hydrogen will be liberated. At 4 atmospheres the hydrogen has a density that would otherwise require a compression to 1000 atmospheres, Zijlstra says. The technique can also be used to purify hydrogen, as a solid-state compressor and as a catalyst.

The Eindhoven labs have developed a number of new processes in integrated circuits. One of these, called LOCOS (Local Oxidation of Silicon), was described for us by Rein de Werdt. The starting material, silicon, is locally covered with a thin layer of silicon nitride. This layer serves primarily to mask the silicon during oxidation. This masking makes it possible to use relatively thick oxide layers and yet define the openings in these layers with very high precision by means of the thin silicon-nitride pattern. The technique allows very high packing density, we were told.

Our final visit was a demonstration of the new Video Long Play equipment that Philips expects to market in about two years at a cost of a color-television set. The unit attaches to an ordinary color set; the video information is recorded on disk and uses an optical readout. Volger feels that the VLP may have as revolutionary an effect on the way people live as radio or television did in the past. —GBL

Scientific workers union forms professional group

A Professional Employees Division has been formed within the Oil, Chemical and Atomic Workers International Union. The division will represent industrial scientists and engineers.

According to *Professional Advancement*, the new bimonthly publication of the division, "The job recession revealed important weaknesses in what industrial scientists and engineers had long regarded as rights of their profes-

sional status." Problems of layoffs, pensions, wages, hours and working conditions are among those of interest to the division.

The first director of PED is Frank C. Collins, a physical chemist, who is on one year's leave from the Polytechnic Institute of New York.

in brief

Status and Future Manpower Needs of Physicists in Medicine in the United States (Pub. No. FDA 74-8014) is for sale from the US Government Printing Office, Washington, D.C. 20402 (no price established).

The newly formed ATC Betatron Corp., West Allis, Wisc. has purchased the Allis-Chalmers betatron business.

Applications are welcome from physicists for overseas university lecturing and advanced research awards for 1975-76 under the Senior Fulbright-Hays program. Write for information to Senior Fulbright-Hays Program, 2101 Constitution Ave NW, Washington, D.C. 20418. The deadline for applying is 1 July.

Wave Electronics, a new bi-monthly journal publishing papers on the use of wave interactions for communication purposes, will soon begin publication, probably in the summer of 1974. Sample copies are available from Elsevier Scientific Publishing Co, PO Box 211, Amsterdam, The Netherlands. Manuscripts should be submitted to C. D. W. Wilkinson, Dept. of Electronics and Electrical Engineering, The University, Glasgow W.2, UK.

Interactive Radiation, Inc. (INRAD) is a newly formed service company specializing in custom design and development in crystal technology, acousto- and electro-optic components and cross-disciplinary systems involving chemistry, optics, physics and electronics. INRAD's president is Warren Ruderman, founder and former president of Isomet Corp.

The *Journal de Physique* now includes a letters section. Letters may be self-contained communications or brief accounts of extensive work including new experimental data and instrumentation.

Laser Inc., a newly formed company, has purchased the commercial solid-state laser and accessory business from American Optical Corporation. The new company is based in Sturbridge, Mass.

The 1973-1974 *Directory of Visiting Lecturers and Research Scholars* is available free of charge from Committee on International Exchange of Persons, 2101 Constitution Ave, N.W., Washington, D.C. 20418. □