16.7–4 X-RAY DIFFRACTION APPARATUS FOR EXPERIMENTS WITH SYNCHROTRON RADIATION AT ADONE IN FRASCATI.

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The broad spectral distribution, the extreme brightness and the small angular divergence of the Synchrotron Radiation give a great advantage in its use as a tuneable source for X-ray spectroscopy and crystallography.

A joint project between the CNR and the INFN provides the realization of automatic instrumentation to be used in X-ray diffraction experiments at the Adone storage ring in Frascati.

For such a purpose the following instruments have been made:

1) A double circle diffractometer for powder samples based on Stoe goniometer.
2) A four-circle diffractometer (Huber) with a double crystal monochromator.
3) A real time X-Ray pattern display with an image intensifier and a CCD-TV camera.

All these instruments are fully automatized so that they act as peripheral units connected to a host computer. For alignment and adjustment purposes they stand on tiltable platforms remotely controlled by the same computer. Here we report: hardware and software, the changes made on the standard mechanical apparatus and some preliminary measurements made in order to check-up global performances.

16.7–5 PROGRAMMED CRYSTAL GROWTH ON THE DIFFRACTOMETER WITH FOCUSSED HEAT RADIATION. By

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For single crystal diffractometry of low melting materials, e.g. liquids or gases at normal conditions, crystal growing directly on the diffractometer is a useful and often indispensable strategy. Still, depending on the special problem, it may occupy the instrument for a long time and demand great skill and patience from the investigator. A new technique has been developed which may improve the situation in many instances. It uses a miniature zone melting or Bridgman method with focussed infrared radiation and is controlled by a microprocessor. It allows systematic variation of experimental growing conditions and their strict reproduction and thus makes finding of suitable ones for the sample under study much easier and faster. Crystal growing by this technique may become a routine procedure, being reproducible also for others working with the same device.

16.7–6 EIN NEUES KONZEPT FÜR DIE POLARISATIONSMIKROSKOPIE. Von

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Durch das neuentwickelte Polarisationsforschungsmikroskop Polyvar Pol ist es dem Anwender möglich gemacht worden, alle bekannten Techniken der Polarisationsmikroskopie auf einfachste Art realisieren zu können. So ist es mit einem Satz von Objektiven ohne Geräteumbau möglich, alle orthoskopischen Beleuchtungsarten für Auflicht und Durchlicht anzuwenden und auch Konoskopie an Körnern bis 6 µ durchzuführen. Ein automatisches Photosystem für alle gängigen Formate von 24x36 mm bis 8x10 inch ermöglicht eine laufende Dokumentation. Die breite Zubehörpalette umfasst neben einem Mikrörefraktometerspindeltisch auch einen neu entwickelten mikroprozessorgesteuerten Ultramikrohärteprüfer für Lasten von 0,05 bis 200 p mit Wahl der Eindruckgeschwindigkeit, der Haltezeit und der Anzeige der effektiven Eindrucklast und einem eingebauten Rechner zur automatischen Anzeige des errechneten Ergebnisses. Die Erweiterung auf den Wellenlängenbereich bis 2000 nm ermöglicht es, das Verhalten ausgewählter Materialien und deren kristalloptische Eigenschaften im nahen Infrarot zu untersuchen.

16.7–7 HIGH TEMPERATURE X-RAY DIFFRACTOMETER USING YAG LASER BEAM. By

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Electric resistance furnace or gas flame furnace or infrared furnace is used as the heating device of high-temperature X-ray diffractometer. These conventional methods,however, are not suitable for carring out the high-temperature diffraction of non-oxide ceramics for the following reasons:The conventional electric furnace can not attain a temperature over 1500°C. The gas flame furnace oxidizes and decomposes the samples in high temperature. The infrared furnace disturbs the incident and/or diffracted X-ray and does not give the accurate measurement.

The author has recently built on a experimental basis of high-temperature X-ray diffractometer using YAG laser beam as a heating source from 24°C to 3000°C. This device,being mounted on precession camera or four-circle automatic diffractometer, has the following advantage. (1)Will enable a temperature of more than 3000°C to be attained easily.(2)Makes it possible to perform high-temperature X-ray diffraction experiments of non-oxide ceramics because this device can provide a selected atmosphere surrounding the crystal in order to prevent the heated sample from being decomposed. (3)There is no obstacle such as interrupting incident and/or diffracted X-ray,so that the precise data collections are available at high temperature even over 2000°C.(4)This is free of any heavy weight load of heating furnace.