THE CENTENNIAL OF X-RAY DIFFRACTION (1912-2012).

An international conference organized by Accademia dei Lincei jointly with Accademia delle Scienze di Torino, European Crystallographic Association (ECA), European Molecular Biology Organization (EMBO), University Roma Tre and Associazione Italiana di Cristallografia (AIC).

Date: May 8 and 9, 2012.
Venue: Rome, Accademia Nazionale dei Lincei, Via della Lungara 10.
Program: it will feature presentations by three Nobel laureates, one Ewald prize recipient, and 12 internationally renowned speakers. The invited lectures will cover most aspects of X-ray diffraction, from the theoretical to the experimental, and from historical to recent developments.
Organizing committee: M. Brunori, G. Ferraris, A. Mottana (chair), R. Oberti, R. Righini, P. Rossi, G. Setti, A. Zecchina.
Further information: please visit the Accademia dei Lincei website (www.lincei.it/convegni/).

Historical-scientific grounds: There are plenty of reasons to celebrate the centennial of the discovery of X-ray diffraction (XRD). One day in May 1912 three young physicists post in Munich an envelope containing the description of some experiments two of them had carried out during the previous two months, following the suggestion of the third colleague. The two experimentalists were Paul Friedrich, an assistant professor, and Walter Knippig, a doctorate student; their mentor was Max von Laue. In February of the same year, von Laue, a young *Privatdozent*, conceives the idea after a chat with Paul Ewald, a student, and proposes the experiment. On June 8, 1912 their supervisor, Professor Arnold Sommerfeld, Director at the Institute of Theoretical Physics of Munich University, presents the results at the *K. Bayerische Akademie der Wissenschaften*, which accepted them for publication. Thus, June 8, 1912 is the historic date that opened a new epoch of solid state science based on XRD, irrespective of the actual publication and distribution of the manuscript (Friedrich *et al*., 1912). The three Germans were awarded the 1914 Nobel Prize for Physics (but actually received it in 1920, because of the war). In the meantime, information on their results had spread out, opening the way to crystal structure determinations by W. Henry e W. Lawrence Bragg (two Britons, father and son). They were awarded the 1915 Nobel Prize for results obtained starting from November 1912. Again, they could collect their prize no sooner than 1920. By contrast, Manne Siegbahn, a Swede, received it on time in 1924 for further improvements. For the next 30 years nothing new followed in Physics: physicists moved to research that they considered in the front line of science (nuclear physics, during the '30s and '40s). XRD became a favorite tool for research in Chemistry and the Chemistry Nobel prize was indeed awarded to the American Ian Langmuir in 1932 and to the Dutchman Peter J.N. Debye in 1936. Only after World War II did XRD become the essential tool for Molecular Biology: the interpretation of diffraction images taken by Rosalind Franklin made J.D. Watson and F.H.C. Crick gain the 1962 Nobel Prize in the field of Biology. They had solved the DNA double helix riddle. Then a flood of Nobel prizes followed in other areas; proteins, vitamins, RNA, and more and more complex biological matter. At the same time, other prize-winning research was being performed in all fields: Physics, Chemistry, Crystallography, Solid state science etc. Remarkably, in every case XRD proved to be essential.
At present, the crystal structure data banks contain as many as 600.000 inorganic and organic compounds (including 25.000 cards on minerals), all determined by XRD based methods, and they are still expanding. This data is fundamental in various applications: geothermobarometers, drugs, metallurgical instruments, wafers, computer memories, etc. One can even use XRD to study the stars, most of which emit powerful X-ray beams. An entire universe is open or, better, has been opened by recognizing the existence of X-ray diffraction one century ago.