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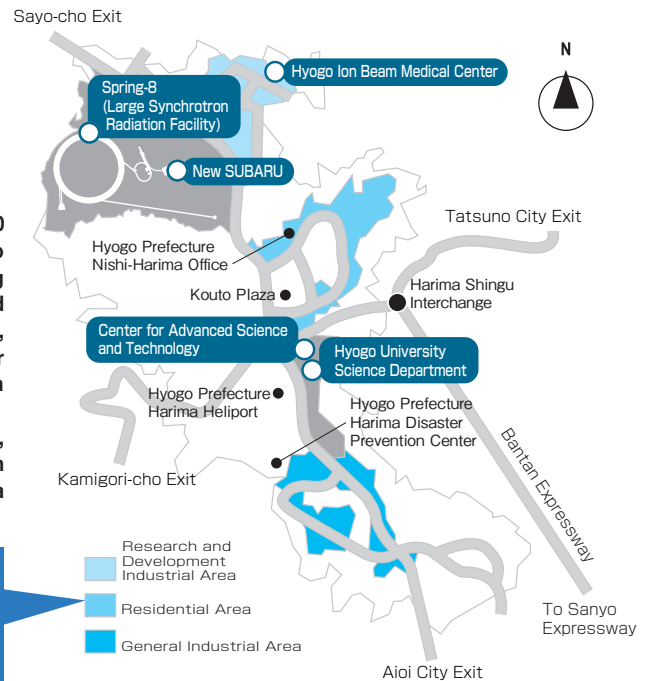
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Hyogo's Cutting Edge Technologies Illuminate the Future of Industry.

SPring-8 is the World's leading synchrotron radiation research facility. In the 10 years since it was opened in the Harima Science Garden in the South West of Hyogo prefecture, research results have been achieved in a wide variety of fields including physics, life sciences, earth sciences, environmental sciences, nano-technology, and bio-technology. Further, facilities are expected to be completed adjacent to SPring-8, for an XFEL (X-ray Free Electron Laser) Generator. This will continue to bring our national technological base into the future of science as the source of next-generation synchrotron radiation technology.

For more information about current and expected industrial applications of SPring-8, please contact Yoshio Watanabe at the Japan Synchrotron Radiation Research Institute, and regarding opportunities and XFEL development, please contact Tetsuya Ishikawa at the RIKEN SPring-8 Center.

[Harima Science Garden City] Constructed out of the concept of a highly functional Capital (Science and Technology Capital, International Exchange Capital, Scenic Park Capital, Health and Medicine Capital) in harmony with man, nature, and science. Here, a number of research institutes have gathered, including the Large Synchrotron Radiation Facility "Spring-8", Hyogo University Science Department, the Center for Advanced Science and Technology, and the Hyogo Ion Beam Medical Center, etc., and research facilities for private companies have also been developed.



SPring-8 takes one step closer to Industrial Application



Japan Synchrotron Radiation Research Institute

Yoshio Watanabe

PhD Engineering
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Features High Energy and Industrial Applications

The greatest feature of SPring-8 is the high energy yield of the synchrotron radiation. It has the merit of allowing us to gain a great deal of new high quality data on the research of molecules at an atomic level. Also, another feature is the fact that this facility, compared to synchrotron facilities overseas, is highly focused on finding industrial applications for the technology. While most overseas centers are focused on protein structure analysis and long term large scale businesses, SPring-8 is a little more pragmatic about developments. They have a good track record of developing industrial applications in a variety of industries, being used by 170 companies last year.

A lot of these applications are in fields which analyze on a molecular or atomic level, such as environmental, energy, and chemical related industries etc. Recent applications in areas more related to everyday life, such as cosmetics, are also increasing. There has also been a sudden surge of use directly in product development in such fields as hair care, transdermal therapeutics, and dental drug products.

Selection of Users Important for Development of Japanese Industry

For businesses that use SPring-8 for free (although they must pay for any items used), we have an application process twice a year, where they make application and we then divide our 25 beamlines depending on how they will be used. The results are generally published. Examination of applications is performed by external experts such as university professors, and selection is based on the technological significance of the science, the need for synchrotron radiation, safety, and the potential for success. In the case of Industrial use, the emphasis is placed on whether it will advance the Japanese industrial infrastructure more so than the significance of the science itself.

It would also be possible to install a beamline purely for corporate use, but it would be too expensive for the number that would use it, and there are already beamlines in operation which have been set up by several companies working together.

From this Autumn, the Facility will be even Easier to Use.

As the number of applications for industrial use continues to increase, the time which the beamline can be used is limited, creating a demand which is larger than supply. This Autumn, we are implementing several measures in an attempt to close this gap.

First, with regard to the XAFS (X-ray Absorption Fine Structure) system which is widely used by industry, we will establish a beamline purely for this application. Also, since many companies at this time are conducting research on an independent basis, there is a lot of similar research going on without collaboration, leading to inefficiencies. So in order to facilitate more efficient use of the beamlines, basic research to develop solu-



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tions to problems which affect whole industries or for measures which are not yet developed will be encouraged to be conducted in collaboration with other companies.

To better reflect the needs of corporate users, systems will be changed. For example, in deference to those companies who have indicated that applications twice a year do not match with their internal development cycles, applications will now be held 4 times a year. In view of the patenting process which is so important for companies, publication of results will also be postponed for 2 years.

Total Support, from Consultations to Vicarious Experimentation

At present, SPring-8 has 9 coordinators. They are all renowned emeritus professors who have retired from