From Waste to Indispensability:
The Rise of Synchrotron Light Sources

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We provide a general overview of the history and physics of synchrotron radiation sources and how they have impacted many fields of research, including the study of biological and environmental systems. First, we briefly summarize the basic principles of electromagnetism involved in generating radiation. We then highlight the physics involved in synchrotron light sources. Next, we discuss their applications to a variety of science and engineering fields. Finally, we describe the recent interest in a new generation of accelerator-based light sources called Self-Amplified Spontaneous Emission (SASE) free-electron lasers and comment on their applications.