

# 31st International Symposium on Lepton Photon Interactions at High Energies



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## The Belle II Upgrade Program

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The Belle II experiment at the SuperKEKB e<sup>+</sup>e<sup>-</sup> collider has started data taking in 2019 with the perspective of collecting 50ab<sup>-1</sup> in the course of the next several years. The wealth of physics results obtained with the current data sample of about 400fb<sup>-1</sup> is showing that the detector is working well with very good performance, but the first years of running are also showing novel challenges and opportunities for reliable and efficient detector operations with machine backgrounds extrapolated to full luminosity. For this reason, and also considering that an accelerator consolidation and upgrade shutdown is being studied for the timeframe of 2027-2028 to reach the target luminosity of  $6 \times 10^{35} \text{cm}^{-2} \text{s}^{-1}$ , Belle II is defining a detector upgrade program to make the various sub-detectors more robust and performant even in the presence of high backgrounds, facilitating the SuperKEKB running at high luminosity.

This upgrade program will possibly include the replacement of some readout electronics, the upgrade of some detector elements, and may also involve the substitution of entire detector sub-systems such as the vertex detector. A Conceptual Design Report is currently planned for mid 2023. This paper will cover the full range of proposed upgrade ideas and their development plans.

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