

PAUL SCHERRER INSTITUT



# Particle Theory Seminar

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“Towards a complete NNLO Prediction of the  $\bar{B} \rightarrow X_s \gamma$   
decay rate”

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## **Abstract:**

An interesting process in the indirect search for non-standard physics is the inclusive rare decay of the B meson into final states with an s-quark and a photon. Since it is a FCNC process, the first non-vanishing contribution in the SM starts at the one-loop level, making it a perfect ground to study charged scalar exchanges, various SUSY effects and more. The current NNLO prediction of the  $B \rightarrow X_s \gamma$  branching ratio suffers from uncertainties related to the scale and scheme dependence of the c-quark mass, which will be reduced if the full  $m_c$ -dependent matrix elements have been calculated at  $\mathcal{O}(\alpha_s^2)$ . In this talk, I will present the current status of this calculation, show the main obstacles and discuss the methods that were used.