The 33 KPSI Seminar
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On the High Field Initiative Project at ELI-Beamlines

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The ELI (Extreme Light Infrastructure) is a unique European project to build large research facilities. ELI-Beamlines as a cutting edge laser facility is currently being constructed in Dolní Břežany near Prague. ELI will be delivering ultra-short, ultra-intense laser pulses with extremely high peak power. It will make available laser beams over a wide range of intensities for multi-disciplinary applications in physics, medicine, biology, material science, modeling astrophysical processes under the conditions of terrestrial laboratories and fundamental sciences. With the ELI-Beamlines lasers new physics regimes when, as yet, unexplored processes come into play, will be accessed.

The HIFI (High Field Initiative) project has recently begun its work at ELI-BL. The HIFI project is established to be the leading project in the high field science. In contrast to other approaches we are emphasizing the synergy between the theory and experiments and building a strong theoretical group to develop new ideas for experiments. In parallel we are building a computing center aimed at conducting computer simulations. The project will advance our knowledge of laser accelerated electrons and ions as well as high energy photon generation in novel regimes when radiation friction and quantum electrodynamics processes, such as electron-positron pair creation and vacuum polarization, become significant. To explore this regime experimentally an upgrade of the existing at ELI-BL infrastructure around the 10 PW laser beam will be done within the HIFI project.