

MORE FLASH.

Construction start for FLASH II

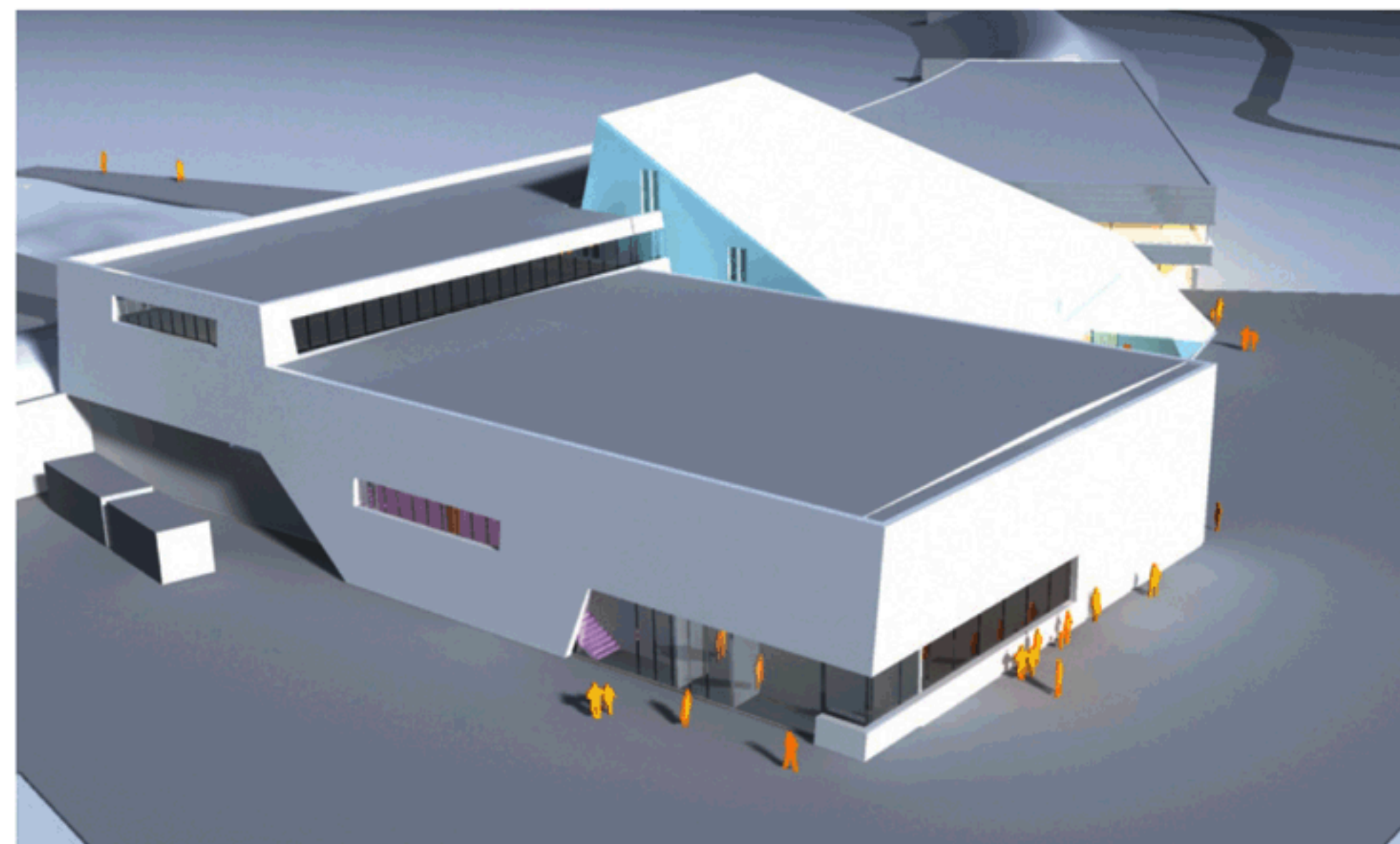
In recent years, the free-electron laser (FEL) FLASH at DESY has been generating laser light in the vacuum ultraviolet and soft X-ray region for an increasing user community. The demand for this type of high-brilliant, short pulse, coherent radiation is still growing at an impressive pace, so that the Helmholtz Association, to which DESY belongs, decided to finance the next expansion stage of FLASH, which will double the number of experimental stations for free electron laser light at DESY: the FLASH II project. This ambitious and strategically important project, for which a finance volume of nearly 30 M€ is planned, has the aim to serve more users and at the same time to explore most recent developments of FEL technology like FEL seeding that will provide photon pulses of defined timing and spectral properties unlike the present day SASE FELs.

Construction has started on 20 September 2011 and is quickly progressing. Commissioning of FLASH II is planned for 2014. In a newly constructed experimental hall next to the existing FLASH hall, five measuring stations will gradually become available for user experiments.

To this purpose, the existing tunnel for the superconducting linear accelerator will be extended by a new tunnel section including a second line of undulators. These special magnets generate X-ray light by forcing up to 8000 electron-bunches per second on a slalom course through the magnets, thus emitting extremely intense radiation. The laser light is then distributed to individual beamlines with different experimental stations. FLASH II will be equipped with variable gap (i. e. variable magnetic field strength) undulators emitting light pulses between 60 and 4 nanometers.

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Architects sketch of the planned experimental hall (foreground) adjacent to the existing FLASH hall (blue wall).

In the first construction phase the connection to the existing FLASH accelerator tunnel is being built. The next step will be the construction of the electron beam dump sector in which the electrons are stopped after light emission.

Mid-October, parallel to the FLASH II construction, the photon science division organizes a workshop intended to explore the new research opportunities at FLASH.

FLASH II – Parameters

Free Electron Laser **SASE**

Beam Energy:	0.5 – 1.25 GeV
Bunches per second:	< 8000
Bunch Charge:	0.02 – 1 nC
Wavelength range (nm):	4 - 60
Peak Power (GW):	1 – 5
Spectral width (FWHM):	0.5 – 2%
Peak Brilliance:	$10^{28} - 10^{31}$ Photons/(s mrad ² mm ² 0.1%)
Pulse Energy (μJ):	1 – 500
Pulse duration (FWHM):	10 – 200 fs

