

# FLASH User Operations Newsletter, July 2021

Dear colleagues,

the first large FLASH2020+ upgrade shutdown (from mid-November 2021 to mid-August 2022) is rapidly approaching, and all around FLASH the preparations are actively ongoing. In order to support and inspire you when writing a proposal for FLASH, we put together this seventh issue of our newsletter. With this, we want to keep you updated on our recent activities and developments at the FLASH user facility. References and contact names for the corresponding in-depth information on new instrumentation and features are added to the brief summaries given here. This and all former newsletters are also available at [http://photon-science.desy.de/facilities/flash/news\\_and\\_research\\_highlights/user\\_operations\\_newletter/index\\_eng.html](http://photon-science.desy.de/facilities/flash/news_and_research_highlights/user_operations_newletter/index_eng.html)

Please note that we are **planning another newsletter for September** which will then again be focused **on new features and instrumentation in the experimental halls**, such as the upcoming time-delay compensating monochromator beamline FL23 and the new split-and-delay unit which enables XUV pump–XUV probe experiments at beamline FL24 and later at beamline FL23 as well.

We would be happy to provide you with further specific details on request and are looking forward to receiving your experiment proposal.

With best regards,

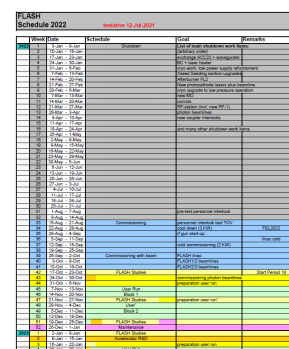
*Martin Beye* \* and *Rolf Treusch* for the FLASH team

\* = acting scientific head of FLASH

## Calls for proposals, deadlines and future user beamtimes

The **next call for proposals with deadline October 1, 2021** relates to **beamtime from November 2022 until June 2023**. With a total of 19 weeks of beamtime this is about 50% more than the usual 13 weeks in former calls and will allow to accommodate correspondingly more experiments. Resubmission of proposals which had been granted and assigned beamtime before but had to be canceled due to the circumstances of the pandemic, is hence strongly encouraged.

In the second half of 2023, there will be another 17 weeks (4 blocks) of user beamtime from June to December. They will be distributed based on a call for proposals which will be issued early 2022, with a deadline presumably on July 1, 2022, i.e. outside the usual (April 1 & October 1) pattern.



The table is a Gantt-style chart titled 'FLASH Schedule 2022' with a date of 'Wednesday, 10. Jun 2021'. It shows a timeline from 2021 to 2023. Key events include 'FLASH Upgrade' (Nov 2021 - Aug 2022), 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022), 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022), and 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022). It also shows 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022), 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022), and 'FLASH 2020+ Upgrade' (Nov 2021 - Aug 2022). The table has columns for 'Beamline', 'Facility', and 'Availability'.

Draft schedule for 2022

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## Major upgrades in the first FLASH2020+ shutdown: shorter wavelengths and variable polarization

During the first FLASH2020+ upgrade shutdown of the FLASH user facility, from mid-November 2021 to mid-August 2022, a substantial part of the work will be dedicated to the upgrade of the accelerator. Besides modernizing the distribution of the accelerating RF power and modifying the cryogenic cooling system, the oldest two of our seven accelerator modules will be replaced with modern XFEL-type modules reaching higher acceleration gradients. Altogether, this work will lead to an even better stability and higher final electron energies of the accelerator. The latter in turn enlarges the accessible wavelength range, reaching higher photon energies well beyond the carbon K-edge in the fundamental.

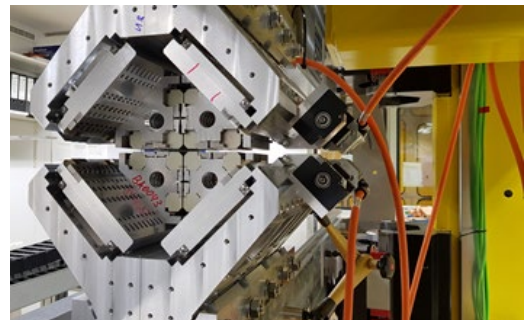
Particularly with the variable gap undulators at FLASH2, advanced undulator schemes like harmonic lasing and the beam line optics optimized for high transmission at short wavelengths, this upgrade will allow for reaching even more elemental resonances with intense pulses for advanced experiments and will extend the opportunities for new studies.



New accelerator module

(Photo: W.Maschmann)

In the FLASH2 tunnel, an 'afterburner' undulator with smaller period and gap will be installed at the end of the existing undulator line. For this, the currently last undulator will be moved to an empty slot at the beginning of the undulator line, in order to make room for the afterburner. This novel APPLE-III type undulator allows for variable linear and circular polarizations. Its period and gap are optimized to produce strong FEL radiation around the Fe, Co and Ni L-edges at the third harmonic of the main undulator line. With reverse tapering configurations, we aim to suppress the FEL radiation at the fundamental such that rather pure and intense circularly polarized pulses between 700 and 890eV (i.e. between 1.77 and 1.39 nm) will be produced, opening new avenues, e.g. for dichroism studies at the L-edges of the elemental magnets.



Apple-III prototype assembly (Photo: M.Tischer)

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