Peter Grünberg Institut
PGI-3: Funktionale Nanostrukturen
an Oberflächen

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To all members of

the **Management,**
the **Science Advisory Committee,**
and the **Council** of the
European Synchrotron Radiation Facility

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Plans to close beamline ID32

Dear members of the management, the Science Advisory Committee,
and the Council of the ESRF

With great concern the Surfaces/Interfaces community has taken note of the official announcement of the ESRF management that beamline ID32 (beside ID20) shall be closed at the end of 2011 for monetary reasons. This profound decision raises unsolvable problems for a large part of the surface and interface science community. Although some of the diffraction experiments can possibly be moved to other beamlines of the ESRF (which will worsen the overbooking at these instruments significantly), there will be hardly any alternative for the hard x-ray photoemission (HAXPES) experiments, and definitely no alternative for the large x-ray standing waves (XSW) community for the next 2-3 years. Hence, these users will be unable to continue their successful projects, with most serious implications for their PhD students, their research groups and their research fields in general. The present situation can be characterized as follows:

1. ID32: A worldwide unique resource with outstanding scientific merit

- At present **ID32 is the only established beamline *worldwide* which combines (NI)XSW and HAXPES experiments, and the only dedicated NIXSW beamline in the world.** This fact was clearly stated in the last beamline review that took place in 2008. The corresponding report pointed out very clearly that the combination of NIXSW and HAXPES is a "**unique resource**", and that the beamline provides "**a world-leading facility for this kind of work**".
- **The beamline is operating very successfully.** This is evidenced by a large number of highly-ranked publications in the last years, as listed below. In particular, the work of many user groups at ID32 has established the NIXSW

technique as a unique and most important tool in the fields of surface/interface and materials science that cannot be replaced by any other method. This is impressively documented by the continuously rising number of ID32 users that are applying NIXSW to a wide range of materials. The quantitative data from NIXSW on bonding distances at interfaces have a very strong impact in modern surface science. This is also reflected by the large interest of theory groups.

- **There is no other synchrotron source that could take over the present or future demands of (NI)XSW and HAXPES beamtime.** The instrument which recently went into user operation at the resonant scattering / diffraction beamline P09 at PETRA III is a dedicated HAXPES endstation which will share beamtime with two other experimental stations. It can in no way accommodate the very high number of ID32 proposals. The other future alternative, beamline I09 at the Diamond light source, is far from starting operation; it will not be available to the users until 2013. No other NIXSW beamlines are available or planned worldwide. This is to be seen on the background of a significant and steadily increasing demand for beamtime at ID32 by the user community.
- **For in-situ hard X-ray diffraction studies ID32 offers also a unique infrastructure and instrumentation**, in particular for the study of **deeply buried solid-liquid interfaces**, for which very few alternative techniques exist. ID32 is currently the worldwide leading beamline for this type of experiments, and especially some of the electrochemistry experiments will hardly be able to move to other beamlines.

Hence, the decision to close ID32 jeopardizes ***all*** ongoing NIXSW activities, including a considerable number of running or just started PhD projects in all member countries. It also destroys the efforts of many new and young user groups which recently applied for NIXSW beamtime at ID32 for the first time and caused the recent increase of UHV beamtime from 50% to 70% (e.g., Busse/Germany, Barman/India, Wollschläger/ Germany, Beni/Switzerland, Beaurepaire/France, Martin-Gago/Spain, Matolin/Czech Republic, Garcia/Spain, Martinez/France, Tait/USA). The closure will also cause a serious setback to the successful activities in the field of interface diffraction studies.

A delicate side-aspect is that the closing of ID32 has been decided in the same year in which one of the pioneers in of the NIXSW technique, Prof. Phil Woodruff, is awarded the Max Born prize, one of the highest prices of the Deutsche Physikalische Gesellschaft and the British Institute of Physics, in part due to his pioneering work in the field of NIXSW. Much of this award-winning work was in fact carried out at ID32.

2. ID32: A modern, newly refurbished beamline

Within the last 8 years, ID32 has been almost completely refurbished. Two new hutches and a new diffractometer (in exp. hutch 1) were installed in 2003. Since 2005 a new main monochomator, two new UHV vessels with several channel cut post monochromators and a new transfocator with compound refractive lenses have been installed. Proper technical environment has been realized in collaboration with users which now allows surface diffraction studies of electrochemical interfaces with

millisecond time resolution. Finally, in 2009 and 2010 an entirely new UHV endstation for HAXPES and NIXSW in experimental hutch 2 was built. A new HAXPES analyzer started user operation very recently (first XSW user experiment in 2010, SI-2077), and the in-vacuum three-circle goniometer with detector, which now for the first time allows the full range of XSW experiments including XSW imaging, was tested in Dec. 2010. The latest UHV experiments (performed in Feb./March 2011) demonstrated the enormous improvements which were achieved by the new instrumentation of ID32.

It is important to note, that due to these refurbishments, ID32 became a reliable and irreplaceable partner for user groups from mission-oriented research institutes, e.g. IHP (Frankfurt-Oder, GER) and LETI (Grenoble, FRA), which directly interact with many European industrial partners. Consequently, the closure of ID32 will leave a steadily increasing demand unsatisfied.

It is unbearable that at the height of this successful, user-driven development, which incidentally has opened the beamline to new user communities such as the large semiconductor community in academia and industry, the beamline will now be closed. Moreover, in the light of the successful ID32 upgrade and the explicitly stated ESRF policy of not considering recently refurbished beamlines for cancellation or closure (as stated in www.esrf.eu/news/general/ Beamline-closure) we consider the closing of ID32 as particularly unfortunate.

3. The Future: Reopening a HAXPES/(NI)XSW beamline at the ESRF

We believe that all ESRF users – including those working on surfaces and interfaces – understand the difficult situation the management has to deal with at present. However, we also feel that a dedicated beamline with the capabilities that are currently available at ID32 is an indispensible element in the beamline portfolio of the ESRF. We therefore strongly believe that all efforts must be made to avoid losing irretrievably the excellent opportunities that ID32 currently stands for, both for the users ***and*** the ESRF.

We therefore appeal to the ESRF management, the Science Advisory Committee and the Council to do everything in their power to secure a future at the ESRF for the activities that are currently located at ID32.

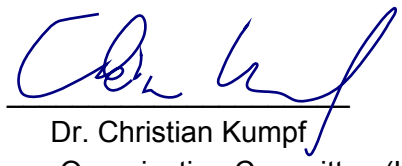
We know that the plans to use the ID32 port for the upgrade beamline 7 are far advanced and probably irreversible. Therefore we suggest the following alternatives in order to alleviate the consequences of the ID32 shut down:

- The closing of ID32 should be postponed as long as possible. According to our information this can be end of 2012, since the space is not needed earlier for building up UPBL7. It would allow the users to successfully finish ongoing projects, including NIXSW-based PhD theses. The extra costs for this time-extension are comparably small, since most of the contracts of the ID32 staff are not expiring before 2013.

- We urge the management, the Science Advisory Committee and the ESRF Council to proactively look for resources for opening a new beamline at a new beamport that will become home to the extremely successful science that is currently carried out at ID32, both by users and beamline staff. On the one hand, new financial opportunities appear at the horizon (e.g. new member states, increased industry funding), while on the other hand two high quality undulator beam ports are currently free. Hence, from our viewpoint, the chances for a new and advanced beamline at the ESRF covering the increasing needs of the ID32 community appear good. We appeal to the management, the SAC and the Council to seize this opportunity immediately when new financial sources become available. Major components of ID32 could become the nucleus for the new beamline. As a matter of course, the user community is prepared to assist in formulating the scientific case for the new beamline.
- We also urge to the management to safeguard that the unique HAXPES/(NI)XSW and interface diffraction know-how at ESRF is preserved. Current ID32 staff should remain available for the set-up and operation of the new beamline.

We are confident that the members of the ESRF Council, the Science Advisory Committee and the management understand our immense concerns. We further hope that it will be possible to find a suitable solution for the needs of the user community on the basis of the suggestions we are bringing forward. It would be most reassuring if the official organs of the ESRF publicly committed themselves to the future of these vital research fields (HAXPES / (NI)XSW, diffraction) at the ESRF, for example by publishing a “declaration of intent” to this effect.

Yours sincerely,



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- F. Golks, K. Krug, Y. Gründer, J. Zegenhagen, J. Stettner, O. Magnussen, **J. Am. Chem. Soc. 133**, 3772 (2011) (featured on cover)
- H. Yamane, A. Gerlach, S. Duhm, Y. Tanaka, T. Hosokai, Y.Y. Mi, J. Zegenhagen, N. Koch, K. Seki, F. Schreiber, **Phys. Rev. Lett. 105**, 046103 (2010)
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- M. Matena, M. Stöhr, T. Riehm, J. Björk, S. Martens, M.S. Dyer, M. Persson, J. Lobo-Checa, K. Müller, M. Enache, H. Wadepohl, J. Zegenhagen, T.A. Jung, L. H. Gade, **Chem. Eur. J. 16**, 2079 (2010)
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- F.U. Renner, A. Stierle, H. Dosch, D.M. Kolb, T.-L. Lee, J. Zegenhagen, **Nature 439**, 707 (2006)