

Life after Brexit

Following the UK's decision to leave the European Union, we asked scientists and industrialists working in the optics sector for their reaction to the news and how it may affect photonics research in the UK.

On Friday 24 June, scientists in the UK awoke to the news that the country's citizens had narrowly voted in favour of leaving the European Union (EU) following a hotly debated national referendum. While the exit is not imminent (the negotiation period to leave will take at least 2 years), the news of Brexit still triggered an instant shockwave through the UK's economic and political landscape, with the British pound suffering a substantial drop in value and the Prime Minister announcing his decision to step down.

The general reaction of scientists working in optics in the UK appears to be a mixture of shock, disapproval, disappointment and concern. For many researchers, the chief cause for anxiety is the introduction of a large dose of uncertainty. In particular, clarity is desperately sought over what the decision will mean for the mobility of researchers and access to EU-funded projects, of which the UK is a major participant.

"There is little doubt in my mind that the UK will be poorer and weaker in the long run by leaving the EU," commented Kishan Dholakia, a leading photonics researcher from the University of St Andrews in Scotland, who says that his views also resonate with those of many of his colleagues. "Scotland and photonics in particular has benefited from numerous EU initiatives such as Horizon 2020, the European Research Council [ERC] and industry-related EU schemes. Indeed, many UK SMEs [small- and medium-sized enterprises] based in Scotland are part of these initiatives which allow them to develop new products in an agile manner in the photonics sector."

Dholakia makes the point that EU funding accounts for over 10% of annual research funding across Scotland, and at St Andrews it is actually twice this value. "Of course many argue that new UK-based schemes to replace these will be negotiated," he commented. "However, it is naive to think that such schemes can be put in place on any timescale that would ensure continuity of funding or reflect research strategy that has been honed over decades through cross-European initiatives such as Photonics 21."

What appears to worry Dholakia most, however, is how Brexit could affect student and researcher mobility. "The possible end of freedom of movement and the uncertainty surrounding this is potentially more

damaging to UK science, and photonics in particular, than the loss of access to Horizon 2020 and other EU funding," says Dholakia. "Unless the UK government sends a clear and affirmative message that there will be no requirements for EU citizens to apply for work or student visas in the academic sector, it will be very difficult to recruit new students, postdocs and staff during the current phase of political uncertainty."



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Dholakia's worry is that the current climate of uncertainty may trigger an exodus of talented researchers and cause those who were thinking of coming to the UK to reconsider and explore other options. "It is certainly already affecting recruitment in photonics, our department has already had several queries with regard to funding for new students from the EU starting this autumn," he commented. "It may also be hard to retain academics who hold substantive EU funding but no UK passport, who may wish to relocate."

Despite the fact that the UK is still a member of the EU for the next 2 years, Dholakia says that the current uncertainties risk creating unwanted barriers.

"As we move forward in collaborative programmes it is not unreasonable to envisage the current climate dissuading our European colleagues from including UK participants in future grant submissions until clarity is achieved," said a concerned Dholakia. "Also, we may well be excluded from European policy-making (the Swiss were in a similar position) in photonics, which will direct future programmes, a further worry."

One answer might be for UK institutions to foster collaboration and funding

opportunities beyond Europe, something that has already been done successfully at the University of Southampton.

"Leaving the EU is an unfortunate mistake, which the UK academic community seems largely to disapprove of. However, it is not a catastrophe for photonics in Britain, which has a significant critical mass and does not depend on large international facilities, while the UK government provides most of the research funding and infrastructure," said Nikolay Zheludev, deputy director of the Optoelectronics Research Centre in Southampton and co-director of The Photonics Institute at Nanyang Technological University in Singapore.

"Research in cutting-edge disciplines increasingly depends on collaborations, but in the modern information society these do not have to be regional. Indeed, at the Optoelectronics Centre at the University of Southampton we have established a grand dual-site research centre with Singapore, without the cooperation-fostering mechanisms available in the EU. However, the EU is certainly needed to provide a healthy diversity of funding, such as via the ERC, and as a source of students and internationally competitive researchers and faculty."

Interestingly, outside academia the view from those working closely with UK firms appears to be that any impact of Brexit is often being overstated. Carlos Lee, director general of the European Photonics Industry Consortium (EPIC), which has 260 members, makes the point that much of photonics is a high-value, highly specialized industry that is truly international in its nature. He says that the value proposition for a particular product or technology to meet a customer's needs has not changed and that even if trade tariffs were introduced, the market for a much-needed product will still exist. "The fundamentals have not been affected, we all need to keep a cool calm head," he told *Nature Photonics*.

This point is backed up by the UK Photonics Leadership Group, which states in a recent blog post on the topic entitled "The Upside of Brexit — photonics exports" that "a good product last week is still a good product today." It makes the point that due to the weakening of the British pound, UK products are now significantly cheaper for foreign buyers, which could boost exports. □