

6 Dec 2021

Re: Application to STEM for Britain 2022

Dear Sir/Madam

This is a reference letter for Mirko Pittaluga, a research scientist working at Toshiba Europe Ltd. under my supervision and a PhD candidate at the University of Leeds under the supervision of Prof Mohsen Razavi. Mirko is currently waiting to defend his doctoral thesis which he submitted in September 2021.

I am happy to support his submission to 'STEM for Britain 2022' as I believe his work as a graduate researcher in recent years is an excellent example of the outstanding research conducted in the UK by early-career researchers.

His work focused on Quantum Cryptography, a line of research that deals with the exchange of encryption keys for use in digital information systems. Quantum Cryptography is a subfield of Quantum Information science, a research area considered strategic by the UK government, which is actively supporting it through the UK National Quantum Technologies Programme (UKNQT).

Quantum cryptography can generate encryption keys with guaranteed security, regardless of the resources available to an attacker. For this reason, it is today one of the most promising resource for achieving the maximum communication security. Mirko's work addressed one of the most the most compelling problems of quantum communications, the limited distance at which it can operate satisfactorily. He led our efforts in establishing a new distance limit for quantum cryptography executed over optical fibre,

reaching in 2021 the distance of 605 km, the current distance record for fibre-based quantum cryptography.

Over the past four years, Mirko has made fundamental contributions to the development of the techniques that have enabled us to achieve this result. His contributions have been both conceptual and practical, ranging from experimental design, simulation, and implementation and data acquisition and analysis. The long-distance quantum communication result he is submitting is a particularly good example of the quality of his work as he coordinated and provided the majority of the work to achieve it.

Yours Faithfully,

A handwritten signature in black ink that reads "Andrew Shields". The signature is written in a cursive, flowing style.

Dr Andrew Shields
Assistant Managing Director
Toshiba Europe Ltd