

Education aspects to create QKD industry

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Abstracts

QKD is an emerging industry. At the same time information security is very conservative industry. Digital information security specialists usually do not study quantum mechanics and it causes sense of magic dealing with QKD. The only way to close this gap is education. Most available education solutions focus its efforts on theoretical explanation. Meanwhile, if we look at education of telecommunication industry specialists, they have a lot of workshops dealing with signal processing equipment. In this work we want to share our experience of creating a new competition by "WorldSkills" standards. We believe that explanation of QKD via workshops where students can touch by hands optics, electronics and software can change specialist perception from magic to telecommunication equipment.

What is it about

Quantum Communication and Photonics Science Kit is a modular QKD setup which is suitable for introduction to quantum mechanics and quantum communications.

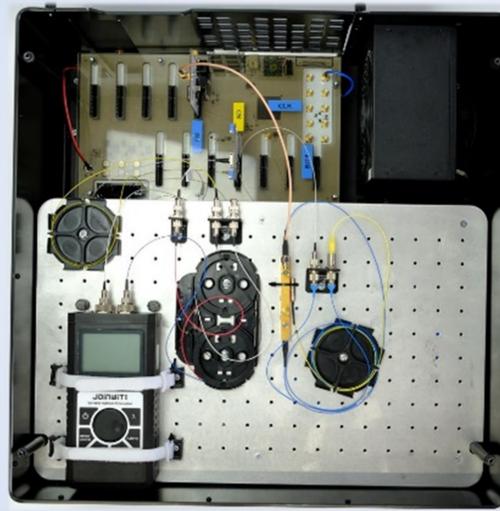
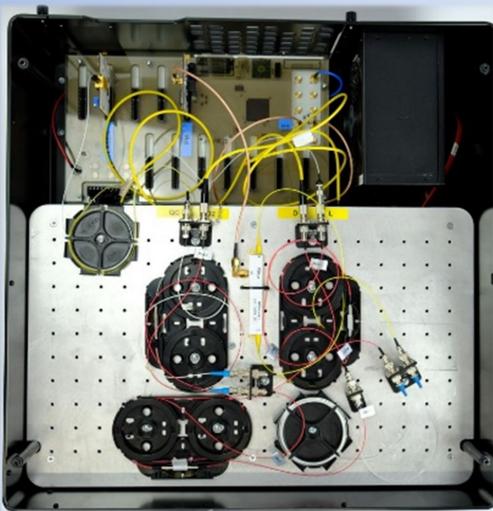
Suitable for:

- Education starting from the middle school and student workshops
- Scientific research works
- R&D projects
- Competitions

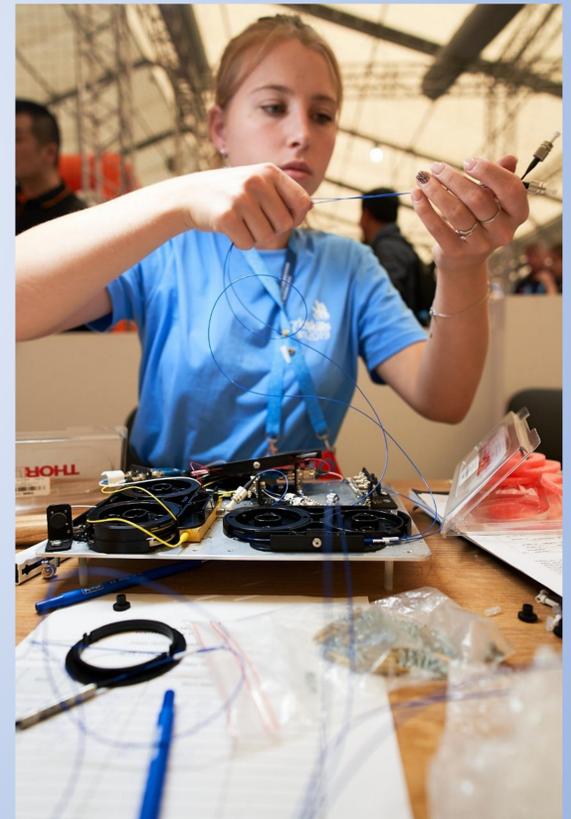
Teaching aids:

- teaching materials
- ready to use workshops
- dissertation and thesis topics for PhD & Master degrees

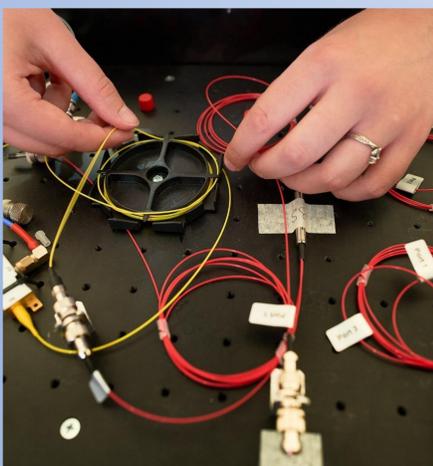
We invite you to try this QKD device online



Optical scheme assembling in the scope of World Skills competition



Book online access time slot:
<https://qrate.online/>



Conclusions

Today universities prepare enough specialists for future developers of the new QKD devices. But in the nearest future we will see high demand for specialists to manufacture and maintain QKD devices, make architecture of quantum network, integrate QKD in existing information security and finally create new solutions based on quantum keys. We propose to discuss this problem in advance to avoid future bottleneck on the QKD market growth. In many universities, a course on atomic physics, presented on a semi-phenomenological level, serves as an introduction to quantum physics. This is a traditional approach, consistent with the historical development of quantum physics - the explanation of blackbody radiation and spectral lines of gas. Meanwhile, such an introduction to the subject distracts from the key provisions of quantum physics and creates a false sense of understanding the subject. We believe that another way of introducing the fundamentals of quantum physics is much more effective - through the two-dimensional space of states of polarization. A modest acquaintance with the very basics of linear algebra allows you to correctly tell about quantum superposition, to introduce the Hilbert space. And understanding the BB84 protocol allows one to consolidate the postulate of quantum measurements in practice. Our experience shows that this technique works great also with motivated high school students.

I also invite you to Special Issue on Quantum Random Number Generation
<https://epjquantumtechnology.springeropen.com/new-content-item>

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