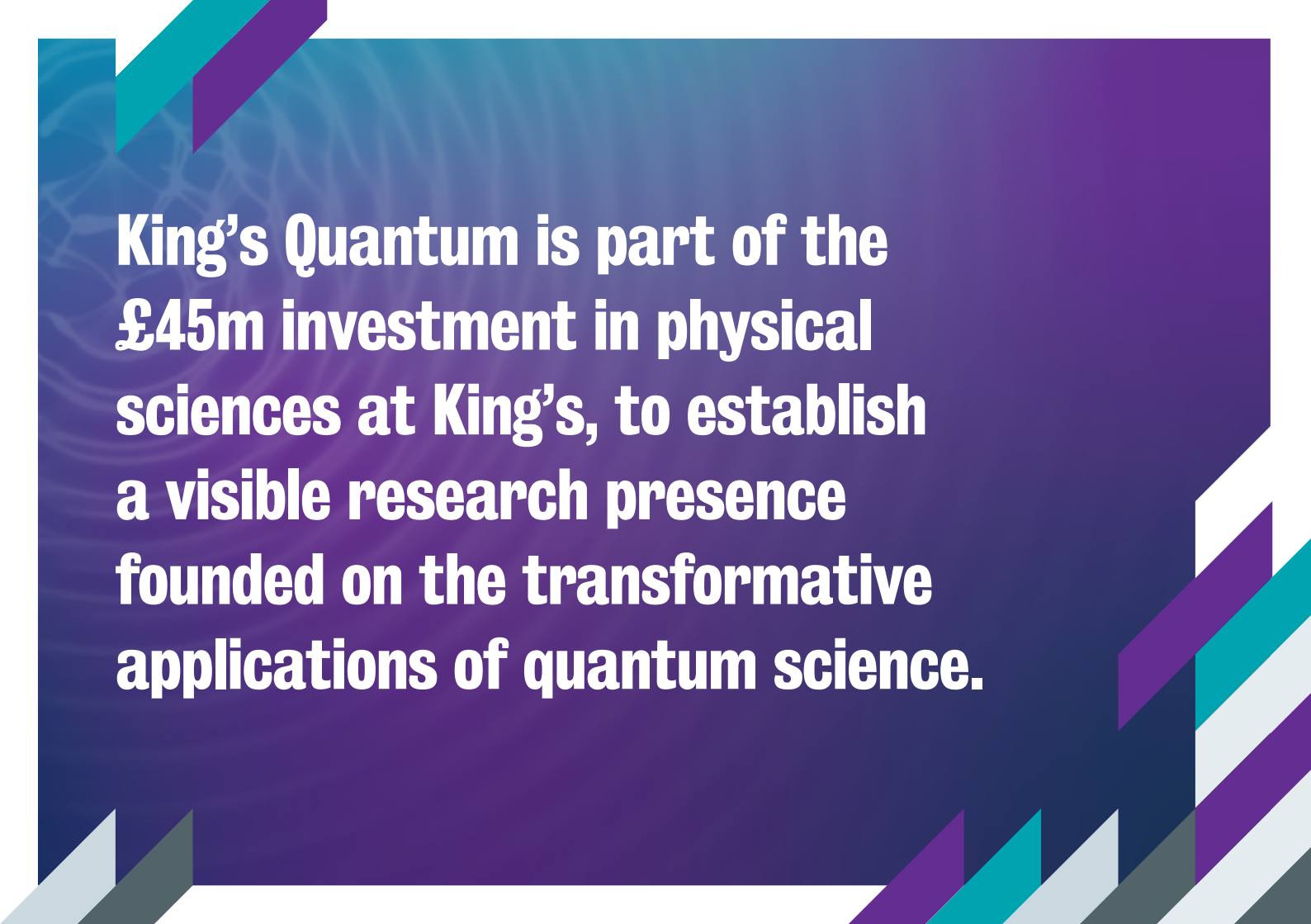


FACULTY OF NATURAL, MATHEMATICAL
& ENGINEERING SCIENCES

KING'S
College
LONDON

KING'S QUANTUM

BUILDING A MULTIDISCIPLINARY RESEARCH COMMUNITY



**King's Quantum is part of the
£45m investment in physical
sciences at King's, to establish
a visible research presence
founded on the transformative
applications of quantum science.**

Foreword

King's Quantum leverages our expertise and knowledge to deliver transformative technology for healthcare, life sciences, security and industry. We are facilitating collaboration with partners in industry to drive effective change.

King's Quantum brings together quantum practitioners with our world-leading quantum adopters in healthcare, life sciences and beyond to deliver transformative quantum technologies. These technologies will contribute to furthering net zero, climate forecasting, drug discovery, autonomous vehicles and the development of new materials.



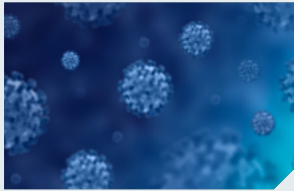
Dr James Millen
Director



Professor Mohammad Mousavi
Co-Director

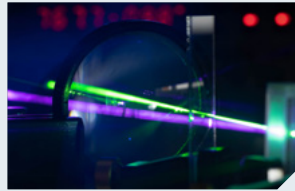
Leveraging our world-class quantum practitioners to broaden industry collaborations.

World leading areas of quantum adoption



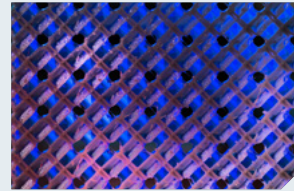
Health & Life Sciences Applications

King's Quantum drives collaboration between physical and health sciences to promote the application of quantum technologies in health-related settings. This ranges from the application of quantum technology to synthesising and analysing biomolecules, to drug repurposing and discovery, to quantum-enabled medical imaging.



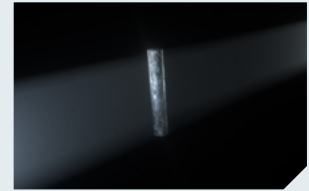
Quantum Security & Cryptography

King's Quantum has a strong portfolio of research on various aspects of cyber-security, encompassing protocols, human factors and cryptography. We perform research on post-quantum cryptography, as well as validation and verification of quantum protocols including quantum key distribution.



Simulation & Materials Discovery

King's Quantum has a strong foundation in quantum simulation and quantum machine learning, including quality assurance, validation and verification. We apply quantum technologies to design novel metamaterials and discover new superconductors.



Sensing & Physical Realisation

King's Quantum leads an international network of world-leading scientists building low-noise quantum sensors, with applications in EM field sensing, navigation and earth monitoring. Our labs study levitated sensors, attosecond control and nanoscale plasmonic devices.

Collaborate with us



Consultancy

Consultancy provides academic expertise to help solve an issue or provide longer term, strategic advice for a business. Projects might include the design, testing or evaluation of a product, service or system or use of the university's research facilities and expertise for testing and analysis of materials and compounds. We can also consult on analysis and reporting including statistical advice, provide presentations at a seminar or business conference, act in an advisory role, help with the provision of specialist advice and training, and be an expert witness.



Collaborative Research

We actively collaborate with organisations of all sizes and sectors on research projects to boost innovation and develop new products, systems and models. Innovate UK (the UK's innovation funding agency) is a potential funding source for any business-academic partnership. We have a track record of securing funding to support these projects and the resources to manage large collaborative partnerships.



Doctoral Training in Quantum Technologies

We will develop the next generation of quantum scientists through bespoke quantum technologies training. With a focus on plugging national quantum skills gaps in engineering and software design, our doctoral students will work across disciplines and with industry. We are looking for partners to fully or partially fund 4-year PhDs in quantum technologies, to support our research ambitions.



Continuing Professional Development

If you're eager to update your skillset, our Professional Development courses are packed with insights and learning that help you fulfil your potential and boost your career prospects. We can tailor our courses to your business needs and offer the flexibility that your business requires.

Case studies



Drug Discovery

King's has partnered with quantum computing software start-up Kvantify to explore how quantum computing could assist researchers in developing new drugs for neurological conditions including stroke, Alzheimer's and Parkinson's disease. The collaboration aims to capitalise on the department's unique focus on harnessing the transformative power of chemistry to tackle the world's most pressing challenges and Kvantify's quantum computing expertise, fostering a dynamic knowledge exchange as part of a major investment in the natural sciences at King's.



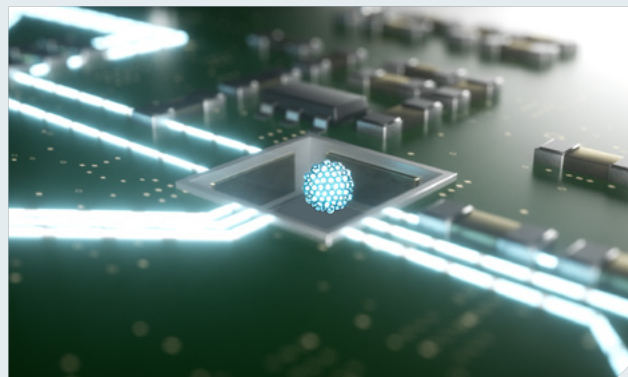
Quantum Dots

King's has pioneered a new, greener approach to make highly engineered quantum dots with optical and electronic properties that can be tuned to the required wavelengths as dictated by our collaborators, enabling the scale-up of quantum dots to be simpler and safer. These particles are being explored in applications such as new light emitting devices and structures, new biological imaging probes to highlight cancers, and we are starting to utilise quantum dots in quantum computing as the source of qubits in novel computer architectures.



Verified Simulation for Large Quantum Systems

Programming became popular thanks to high-level programming languages and compilers which enable running programs on different platforms. We even have certified compilers which ensure the correct execution. This project aims to establish a promising trajectory for quantum computing, taking into account the subtle features of quantum computers. This will be achieved by bringing together expertise in software testing and quantum simulation. The results of this research will lead to verified software for quantum computing applications and to wide-spread and effective exploitation of quantum computing.



Levitated Quantum Sensing

Technology is continuously miniaturising. The overwhelming influence of noise on nano-devices limits their participation in both classical and quantum technologies. By levitating our nanotechnology, this problem is overcome. Ultra-low loss levitated devices offer exquisite force sensitivity, and promise quantum cooling, networking, control and sensing. Levitated quantum sensors could lead to new medical scanners, enhance navigation in autonomous vehicles and make industrial processes more efficient.

For further information, email:

quantum@kcl.ac.uk