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Editorial

Welcome to *Technologies*—A New Open Access Journal

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Technologies of one sort or another have been with us for millennia; our ancestors developed solutions to their everyday problems to improve their—and subsequently our—quality of life. Over the course of history technological development has gone through periods of both gradual evolution and culture changing paradigm shifts. These leaps of progress have enabled greater communication, better generation and distribution of food and through better transportation, greater mobility. It is human nature to endeavour to build on these technological advancements, seeking to ever improve quality of life whilst minimising environmental impact.

Over the last few decades we have seen a new, pervasive technology revolution exploiting the scientific and engineering discoveries which have provided us with new materials, new techniques and increased computational power. Whilst science fiction from the mid 20th century imagined what technology of the future would be and its impact on society, the reality has been arguably even more fantastic. The ubiquity of personal communication devices such as smart phones, enabling people to share and record important life events by providing them with a camera, email, internet access and phone all in one handheld device would surely be inconceivable to most people even a decade ago. The discovery of new materials that combine a whole host of attractive properties that can be exploited in a plethora of applications ranging from medicine to electronics, to defence, and to "smart" clothing. New technology has revolutionised medicine with significant improvements in both diagnosis and treatment of illness. What is perhaps even more exciting than technology providing increasingly sophisticated answers to longstanding global problems is the idea of technology providing solutions to hitherto unknown problems.

The search for new technologies continues to increase in its ambition and challenge. For example, research is now routinely conducted on a scale of a billionth of a metre, opening up new avenues to explore. This includes the opportunity to take advantage of quantum effects and this is where my own interests currently lie. The explosive growth of the internet, telecommunications and wireless

technologies has meant that information is being transmitted around the globe at unprecedented rates and volumes. Information security is of paramount importance at all levels—from an individual's bank details, commercial data to national security. The world's insatiable appetite for ever greater information processing power is the major driver for technological developments in the semiconductor industry. However, this "Moore's Law" cannot be sustained in silicon: as devices reach atomic scales quantum effects will come into play. These effects may, of themselves, provide superior properties to the existing electronic devices: Harnessing these quantum effects will lead to radically enhanced information handling capabilities. However, a major engineering effort is still required to create new Quantum Information Technologies (QITs). As these QITs come into existence they will offer new paradigms in secure communication networks, quantum-enhanced sensors, quantum simulators and quantum information processors, which will provide exponentially more computer power than a classical system for particular tasks. It is my belief that, much as the future applications of a transistor could not be fully conceived when it was first invented, and its impact on society could not be fully appreciated, the applications of QITs will exceed anything that we can currently imagine.

I am delighted to introduce this new peer reviewed open access journal, *Technologies*, which provides a single focus for reporting on developments of all technologies, regardless of their application. It is my intention that *Technologies* becomes the journal of choice for both researchers wanting to publish their work and technologists wishing to exploit the high quality research across a wide range of potential applications. Through its open access policy, its quick publication cycle and by encouraging authors to publish their results in as much details as possible, *Technologies* will facilitate the rapid uptake and development of the research presented, ultimately providing benefit to wider society.

We intend to have a number of topical special issues during our first year of publication; whilst our Editorial Board is currently considering a number of options, we would welcome your suggestions, including appropriate guest editors. I look forward to receiving your submissions; I am confident that *Technologies* will become home to the research that will provide the breakthrough technologies of the future.