

STFC Innovations Ltd – List of patents

IP ID#	Title	What it is	What it does	Possible applications:	Perceived UNIQUE ADVANTAGES	Commercial status:
0079	Sample holder for a cryostat	Holds a sample. Efficient cooling system with exceptional shielding from ambient radiation. A secondary heat exchanger for radiation shield cooling,	The radiation shield around the sample stage is cooled by the cold helium gas returning from the primary heat exchanger. Changing sample heaters and temperature sensors is made simpler. True UHV construction: no soldered joints. Monocoque construction.	Cryostat users to hold samples.	Lower base temperatures push the limits of possible experiments, rapid cool down reduces time spent waiting to reach base temperature and reduced liquid helium consumption reduces operating costs. : There is no need to add cooling for the radiation shield.	Patent US, GB Pending and Granted
0091	Optical Tweezers Nano-Probe	A probe or guide having micrometre dimensions controlled with nanometre precision through the use of optical traps.	The optically controllable device is also ideally suited as a guide for the control and manipulation of small particles. The device may be used to hold a particle to a substrate, or a pair of guides used as tweezers to hold the particle in free space.	High tech. Scanning probe microscopy, various types of optical spectroscopy.	To hold the particle in free space or for the triggering of biological or chemical process in or on cell membranes.	Patent
0103	Optical Tweezers Feedback Sensor	Feedback sensor for optical tweezers	An imaging device using an array of active pixels, with a readout control for output from selected regions of interest. When used to detect the positions of optically trapped objects, the fast readout rate enables fine control of the optical traps to stabilize the objects.	Biotech instrumentation Microscope manufacturers.	Fast readout rate enables fine control of the optical traps to stabilize the objects. Multiple objects can be controlled while being moved relative to each other.	Developed and working Patent Published.
0124	Droplet Deformation	The micro-fabrication of shaped polymer particles by using optical forces to deform emulsion droplets.	The technique uses a well established methodology to generate ultralow interfacial tensions at the surface of emulsion droplets. The invention then relies on optically trapping the emulsion droplet and deforming the droplet shape by splitting the trapping beam into two or more optical traps.	Process improvement for manufacturing microscopic particles. Strong ramen signature. Control of particle morphology for use in colloidal structures.	The trap positions can be altered through computer software to control the droplet deformation. The droplets that can be trapped range from 1 micron to 20 microns and the shapes formed are of similar dimension. the molecule can be stretched using pressure and temperature changes.	Patent
0130	Multi-colour TIRF	LAB in a Cell	Fluorescence microscopy for examining cell membranes about the molecular mechanisms at the boundary to the cell interior.	Observing the reaction of drugs in a cell membrane.	Reduced set up time, More accurate, Examines cell processes in the cell membrane.	Patent, Proof of principal.
0121	Boron Carbide Ballistic Armour	A cohesive dough-like material that can be free-formed or moulded. It can be easily shaped and cured at low temperature.	Putty which can be moulded into any shape and can be used as fast repair ceramic for protection against high energy projectiles such as small arms fire and armour-piercing bullets.	Tank repair or repair of any critical structures. Military, Oil and Gas.	A cohesive dough-like material that can be free-formed or moulded. It can be easily shaped to small feature sizes and sharp, strong edges, Properties High strength, High density, High neutron stopping ability.	Patent pending some test data
0144	Isotope Ratio meter	Sensor for tuneable real-time high precision measurement of CO2 isotope rate. Tuneable laser based isotope analysis.	Tuneable laser absorption spectroscopy is an attractive method for real-time in situ monitoring of stable isotopes. Capable of isotopic ratio instrumentation capable of sub per mil precision and accuracy.	Medical device, Food quality control, geo-chemistry, atmospheric chemistry, life sciences and medicine. Applications in many fields including geo-chemistry, atmospheric chemistry, life sciences and medicine.	Low cost Compact, robust, portable, field deployable, high frequency data, real time monitoring, No sample preparation, Can discriminate isotope having a small mass difference (like H and D based stable isotopes), totally insensitive to temperature variations provide at least 0.1 per mil precision.	Patent, Proof of principal
150	Current Mode Data Transmission	An apparatus for communication down a DC power line.	Enables bi-directional, full-duplex, data transfer over power lines in serial powering systems powered by a constant-current source. The possibility of sending digital data over power lines solves several problems whenever there is the need to establish communication between a	Anywhere with Digital Power lines.	Reduced number of communication cables; minimum weight of cables; bi-directional communication using one set of cables only; increased reliability; high-speed. Constraints on number or weight of power cables and necessity to establish communication between host and remote units.	Patent

			host and remote unit			
152	Mass Discriminator, Mini Mass Spec.	A disposable mass spectrometer.	The current design is focused to achieve the mass discrimination of stable isotopes although wider mass ranges may be targeted. The sample entry, ionisation, focusing and collection all occur on A device the size of A credit card.	Medical Devices, Environmental instrumentation	Very small disposable single use	Patent, Proof of principal
174	Extension Sensing Actuator	Actuator with embedded sensing	Incorporates direct measurement sensors into piezoelectric actuators to enable accurate monitoring and control. Facilitates continuous monitoring and correction of displacement, enabling optimum performance despite external or internal changes.	Automotive, aerospace, microfluidics, adaptive optical systems in range finding, laser cavities, and telescopes	Improvements in efficiency, performance, speed of response. Technology makes integration of the extension sensor with the actuator possible, forming a robust unit suitable for industrial applications.	Patent
865	Micro FT	Imaging spectra at infra-red wavelengths, to detect and identify a range of liquids and gaseous chemical species.	The reflectance and transmission spectra of solid, liquid and gaseous samples provide information on their chemical composition. Fourier-transform spectroscopy yields high quality spectra and provides an important analytical tool using light at infra-red, visible and UV wavelengths.	Automotive Industry, Manufacturing Industry, Power Generation, Environmental Protection, Medical Diagnostics	The low power requirements and minimised size (50mm x 50mm x 30mm) and weight (0.4kg) Can identify a range of liquid and gaseous chemical species either in situ or remotely. High speed data acquisition, improved accuracy, monitoring dynamic processes.	A prototype has been constructed that successfully demonstrates the principles behind the novel.
867	Imaging Device Radiation Detector	Imaging Device for measuring small changes in Incident radiation.	Provides information regarding rapid increases in incident radiation. The sensor is sensitive to a variable quantity to be imaged, such as visible or non-visible radiation, and a signal representative of the quantity is output over a monitoring period, as well as timing of incidence.	SEM manufacturers, Space, for use with optical tweezers.	Varied data output, potentially faster frame (and therefore processing)	Patent
868	PT Complexes	Inert platinum complexes for live cell labelling and imaging.	A highly emissive, synthetically versatile and photo stable platinum (II) complexes that make Time resolved emission imaging microscopy (TREM) a practicable reality.	Pharmaceutical, drug discovery	The new Pt complexes are unique in easily labelling cell organelles.	Patent,