[KRISS] Study Proposal of International Admission for 2020 Spring Semester

No.	Major	Sub-Major	Research Group (Team)	Study and Research Proposal
1	Science of Measurement	-	Physical metrology	· Development of measurement standards for SI unit – Development of measurement standards for SIbase units such as optical clock, Kible balance, etc. – Development of measurement standards for SI derived units such as acoustics, vacuum, etc. · Development of measurement technique – Measurement technique for climate change – Measurement technique for national strategy in IT, defence, etc.
2	Science of Measurement	-	Chemical and medical metrology	· Development of measurement standards for Air Quality – Development of measurement standards for Gas Metrology – Development of analytical technique for fine dust · Ionizing radiation metrology – Development of measurement standards and precisionmeasurement technology for radioactive gas – Development of CRM for radioactive materials – Development of measurement standards and precision measurement technology for radiation cancer therapy and x-ray diagnostics – Development of image standards (CRM) for diagnostic modalities such as PET-CT – Development of radioanalytical technique for the measurement of ultra low-level radionuclides in the environment

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3	Science of Measurement	–	Advanced instrumentation	· State-of-the-art instrumentation based on the measurement technology to respond science and industry demands – Combined instruments with charged particle & laser beam. – Biomagnetism, Ultra-low field NMR/MRI – Smart sensors and MI(measurement and inspection) equipments for the semiconductor industry – High-resolution optical imaging instrument for industrial,defence & space applications
4	Nano Science	–	Physics	· Solid-state physics – Quantum phenomena of nano-device – Material phase transition under extreme condition
5	Nano Science	–	Chemistry	· Materials and biochemistry – Physico-chemical property of energy-related materials – Chemical analysis of nanobio-materials
6	Nano Science	–	Materials	· Material characterization of composite materials – Nanostructure analysis – Characterization of energy/environmental materials

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7	Medical Physics	-	Medical Metorology	· Research on Medical Metrology - Physical Quantities related to Human body : Ultrasound, Blood Pressure, Rehabilitation, Body signal - Quantification and standardization on medical Image : MRI, CT - Biomems, Lab-on-a-chip, Microfluidics
8	Medical Physics	-	Hyperpolarized MRI	· Hyperpolarized MRI research - Development of hyperpolarizer using liquid Helium cryogenics or optical pumping - In-vivo MR imaging of hyperpolarized nanoparticles in cooperation with ABMRC in Yonsei univ. - Application of Para-hydrogen induced hyperpolarization to chemical and biomedical research
9	Medical Physics	-	NanoBio Imaging	· Research on NanoBio Imaging - Development of bio and medical imaging technology : Optical coherence tomography, Photoacoustic imaging, Nonlinear optical microscopy, Digital holographic microscopy - Pathological and physiological mechanisms using laser-based molecular imaging : Study of pathological mechanisms in cardiovascular diseases - Biological safety of nanomaterials : Cellular and tissue toxicology of nanomaterials for industrial applications
10	Bio-Analytical Science	-	Organic Analysis	· Development of analytical methods for natural compounds (functional nutrients, mycotoxin, etc) and veterinary drug residues - Development techniques for analytical separation of complex isomers of functional nutrients and mycotoxins and their detection with LC/MS. Also Its application to food and bio-matrix samples - Extending the LC/MS methods to Isotope dilution mass spectrometry
11	Bio-Analytical Science	-	Bio Analysis	· Development of cell activity and toxicity measurement technology - Development of precise analysis technology for cell proliferation and death - Development of High Sensitivity Analysis Technique of Cellular Damage · Development of gene-based cancer detection method and reference material for liquid biopsy