

[KIGAM] Study Proposal of International Admission for 2020 Fall Semester

No.	Major	Sub-Major	Research Group (Team)	Study and Research Proposal
1	Resources Recycling	—	Resources Recovery Research Center	<ul style="list-style-type: none"> · Creating the foundations for developing and improving resources recycling technologies <ul style="list-style-type: none"> – Recycling of Industrial byproduct such as coal-fired ash, waste catalyst – Recovery of valuable metals from urban mines – Recycling of mine tailings
			Resources Utilization Research Center	<ul style="list-style-type: none"> · Recycling industrial wastes into valuable feedstock <ul style="list-style-type: none"> – Recovery of valuable metals and production of high performance industrial raw materials from industrial by-products (such as silicon sludge, ferro-manganese smelting by-products, titanium and tungsten hard scrap)
			Center for Carbon Mineralization	<ul style="list-style-type: none"> · Mineral Carbonation Convergence and Complex Use of By-products of Industrial and Industrial Industries

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2	Petroleum Resources Engineering	Petroleum Resources	Petroleum Geology/ Exploration/ Development	<ul style="list-style-type: none"> · Technology on origin of petroleum and analysis <ul style="list-style-type: none"> – Development of sedimentary stratigraphy and basin analysis technology – Development of petroleum system establishment and analysis technology – Development of petroleum source rock and sedimentary environment analysis technology – Development of petroleum economy analysis technology · Petroleum exploration and interpretation technology <ul style="list-style-type: none"> – Development of seismic modeling, data processing, migration and inversion technology – Seismic stratigraphy technology – Development of Well logging data processing and analysis technology · Petroleum development technology <ul style="list-style-type: none"> – Development of unconventional energy resources technology such as shale gas, oil sand, gas hydrate – Development of reservoir characterization technology on conventional and unconventional energy resources – Development of petroleum drilling technology
3	Geophysical Exploration	Geophysical Exploration	Geophysical Exploration	<ul style="list-style-type: none"> · Geophysical exploration is an applied branch of geophysics that uses surface and borehole methods to measure the physical properties of the subsurface Earth to detect or infer the presence and position of ore minerals, groundwater reservoirs and other geological structures. This field is the practical application of physical (methods such as gravitational, magnetic, electrical, and electromagnetic methods) to detect measurable physical differences of rocks that contain minerals or other anomalous targets.

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4	Mineral& Groundwater Resources	–	Groundwater Research Center	<ul style="list-style-type: none"> · Characterization of groundwater flow and contaminant fates using environmental isotopes and hydrochemical parameters <ul style="list-style-type: none"> – Analysis of groundwater flow systems using water stable isotopes and conservative solutes – Evaluation of sources and transformation of nitrate and geogenic contaminants in groundwater
				<ul style="list-style-type: none"> · Assessment of groundwater resource and water circulation system <ul style="list-style-type: none"> – Investigation and interpretation for groundwater resources – Analysis and assessment of groundwater resource and water circulation system using groundwater modeling
				<ul style="list-style-type: none"> · Fate and transformation of pollutants (i.e., trace metals, metalloid, and nutrients) at the interface between groundwater and surface water <ul style="list-style-type: none"> – Technology development of biogeochemistry monitoring in sediment and porewater at groundwater and surface water interface including laboratory and field experiments – Understanding the mechanism of biogeochemical processes and microbial characteristics · Bioremediation technology development of contaminants in groundwater and sediment <ul style="list-style-type: none"> – Applications of biogeochemical processes for contaminant (i.e., trace metals, metalloids, and nutrients) removal in groundwater and sediment – Understanding biogeochemically mediated dynamics of trace metals, metalloids, and nutrients in sediments, wetland soils, and groundwater and enhancing their removal efficiency · Evaluation of groundwater chemistry using aquifer media characteristics and environmental geoindicators <ul style="list-style-type: none"> – Hydrobiogeochemical generation mechanism and evaluation for geogenic groundwater components – Characteristics of natural organic matters as environmental indicator in water environments and surface water–groundwater interactions using them – Statistical analysis of groundwater quality components and evaluation of spatial distribution using GIS techniques