Endowed Research Unit for Non-Ferrous Metals Resource Recovery Engineering (JX Metals Endowed Unit)

[Towards Highly Sustainable Society]

Institute of Industrial Science, Endowed Chairs

Non-Ferrous Metals Resource Recovery Engineering

http://www.metals-recycling.iis.u-tokyo.ac.jp/

Industry–University Collaboration Center for Developing New Metal Recycling Processes

Sponsor: JX Advanced Metals Corporation

Recycling valuable materials is crucial for sustainable societal development, with the depletion of high-quality natural resources and the rise of resource nationalism globally. In Japan, advancing the recycling of both rare and base metals has become a vital issue. This research unit focuses on developing innovative, environmentally harmonious recycling technologies for non-ferrous and rare metals using advanced smelting and refining techniques. It also collaborates with industry partners to nurture young researchers and engineers in this field.

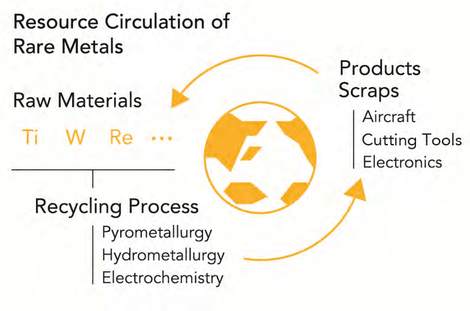
[Period] 1st period: January 2012 to December 2016 (5 years)
2nd period: January 2017 to December 2021 (5 years)
3rd period: January 2022 to December 2026 (5 years)

In the second period, this unit advanced and strengthened the activities undertaken in the first period and spread awareness about the significance of this field among the general public, especially young generation (under high-school age) and their parents.
In the third period starting from January 2022, in addition to the past activities, we are developing newer activities focusing on SDGs and STEAM education.

Research Group

Developing New High-Efficiency Recycling Technologies for Rare Metals

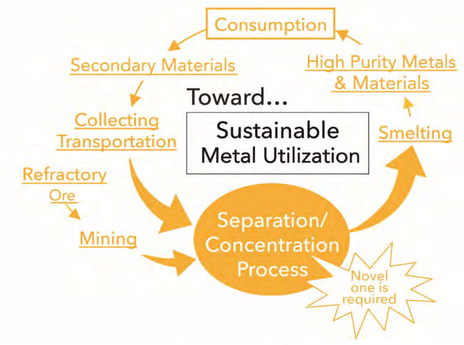
Project Professor Toru H. Okabe



Okabe laboratory is dedicated to developing innovative, high-efficiency, and environmentally sound recycling technologies for rare metals such as titanium, which is anticipated to see increased demand as a structural material; tungsten and cobalt, indispensable in tool materials; rhenium, which is used in nickel-based superalloys; and platinum group metals found in automotive exhaust catalysts.

Development of Separation and Concentration Technologies for Utilizing Waste and Refractory Ores as Resources

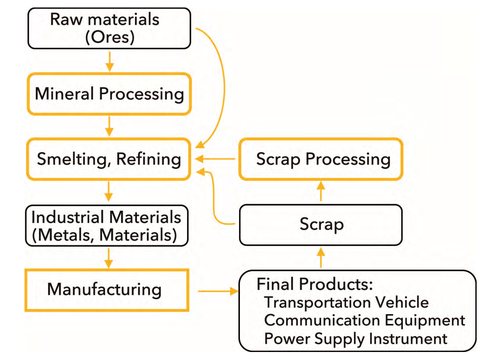
Project Professor Chiharu Tokoro



Tokoro laboratory conducts research to achieve an energy-efficient separation and concentration process that focuses on solid/solid separation and concentration without melting down the waste and ores. This process acts as a crucial “pre-treatment” or “intermediate treatment” in the overall metallurgical or hydrometallurgical processes that produce high-purity metals.

Optimization of Non-Ferrous Metal Smelting Processes

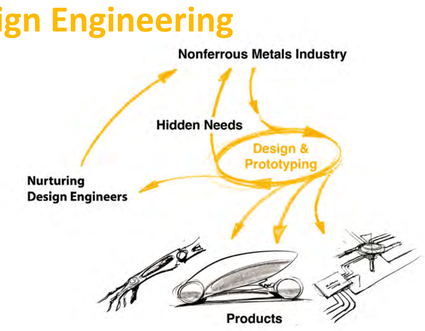
Project Professor Harumasa Kurokawa



Kurokawa Laboratory aims to achieve processes that are energy-efficient, environmentally sound, and cost-effective by minimizing energy consumption in production and maximizing the recovery of target metals to reduce waste generation.

Development of Non-Ferrous Metal Products and Next Generation Education Through Design Engineering

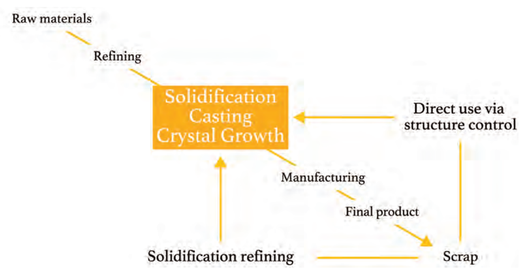
Project Professor Shunji Yamanaka



Non-ferrous metals are indispensable materials for advanced devices and clean technologies. We are committed to new initiatives that demonstrate the value of non-ferrous metals to society at large through the design and prototyping of products utilizing these metals. At the same time, these projects serve as a platform for cultivating new breed of design engineers who possess both technical knowledge and a sense of aesthetics.

Development of Environmentally Sound Materials Processing Aimed at Resource Recycling Based on Solidification Engineering

Project Lecturer Taka Narumi



The primary objective of our laboratory is to develop scientific theory and high-temperature materials processing in the field of metal and resource production based on solidification and crystal growth phenomena. In order to optimize the utilization of scrap metal as a circulative resource, we are proposing novel materials processing that contribute to the creation of a sustainable society, by developing a solidification structure control that can withstand impurities and metal-scrap refining through solidification segregation.