2014年度秋田大学リーディングプログラムシンポジウム／
2014 Akita University Leading Program Symposia

北 良行／Yoshiyuki Kita
プログラム責任講師／Associate Professor with Special Appointment to the Program

秋田大学リーディングプログラム（LP）では、2014年度、国際シンポジウムと国内向けシンポジウムを開催した。国際シンポジウム、国内向けシンポジウムとも、学術的な面をみながらプログラムの目標である実業界と総合的な内容で、企画の段階から学生が参加できる機会を設定することを課題としました。学生はシンポジウムでの発表、ポスターセッションの開催、返信の案内などを担当しました。また、シンポジウムは秋田大学国際資源学部、国際資源学教育研究センターの共催、独立行政法人石油天然ガス及び金属鉱物資源機構（JOGMEC）、一般社団法人資源・素材学会（MMU）、日本素材物性学会（SMERJ）の後援により行われた。

The international and the domestic symposia in 2014 fiscal year were held by the Akita University Leading Program (LP). The contents of both symposia were not intended just for the academics, but also for the audience familiar with business field person which is basic object of LP education cause. Those symposia gave students opportunities to announce their presentation, to manage a poster session and to guide an excursion. The symposia were jointly sponsored by the Faculty of International Resources Sciences and ICREMER1 of Akita University, with support from JOGMEC2, MMU3 and SMERJ4.
国際シンポジウムは9月22日に東京虎ノ門ウィンビルディング地下会議場、9月24日に秋田大学ベラーナ・ビジネス・ラプラザ2の会場で開催した。参加者は両会場合わせて180人程となった。国際シンポジウム秋田会場では、LP学生によるポスターセッションを併設し、シンポジウム後に9月25日（小坂駅前）、9月26日（松尾鉱山廃棄物処理施設）への巡検を実施した。

国内向けシンポジウムは11月26日秋田市民プラザAeで開催され、延べ80人を超える参加者となった。

I. 国際シンポジウム／I. International Symposia

2014年アメライト資源に関する国際シンポジウム「資源経済分野とアメライト資源の潜在」秋田大学のチャレンジと展望したシンポジウムは以下の3セッションで構成された。
1. 重要性が注目される資源に関するRoderick G. Eggertコロラド薬山大学教授、米国地質調査所資源情報センター高斯 Steven Fortier博士等による基調講演
   2. 2014年1月、本学に安信アメライト経済ミッションに同行し協定校提携を行ったモンスパンエドゥアルド・モンドラーネ大学の教授等によるアフリカにおける資源開発
   3. 2014年までの秋田大学リーディングプログラムの紹介・報告

講演数は、東京会場では11件、秋田会場では12件となった。

学生の発表テーマは「LPの活動、サーキャンプに参加」を基本にした。学生の努力のなかがあるか、『秋田には美しい学生がいてうれしい』大学関係者からのお褒めの言葉までいただけた。

学生的発表テーマは以下の通りであった。

The international symposia were held in Toronomon Tokyo (September 22nd) and Akita University (September 24th). The total participants in the both places became 180 people. A poster session was organized by the LP students at the Akita symposium. An excursion tour was also carried out in the Kosaka Smelting and Refinery (September 25th) and the Matsuoka Neutralization Plant (September 26th).

On the other hand, the domestic symposium was held at “Alve” (the Akita Citizen Plaza) on November 26th. The total number of participants was over 80 people.

Remarks
1: International Center for Research and Education on Mineral and Energy Research
2: Japan Oil, Gas and Metals National Corporation
3: Mining and Materials Processing Institute of Japan
4: Society of Materials Engineering for Resources of Japan

II. 国内向けシンポジウム／II. Domestic Symposium

国内向けシンポジウムは「アジアにおけるレアメタル供給障壁への取り組み——アメライトニッケル」を題し、11月26日秋田市民交流プラザ（Ae）多目的ホールで行われた。

レアアースセッションでは海外におけるレアアースの資源開発から、日本におけるレアアース供給、そしてレアアースを使った製品であるNdFeB磁石（レアアース磁石）の開発・応用まで、一連の流れが講演された。

また、ニッケルセッションでは、ニッケルの国際価格動向から、インドネシア2014年開始された鉱石輸出規制と日本の取組みの高品位ニッケル酸化鉱の有効活用についての講演が行われた。

最終セッションではリーディングプログラムの紹介、大学院学生の広瀬髪二君の研究活動報告を行った。

The symposium was titled, “Efforts in the Supply Disorder of Rare Metals in Asia: Rare Earth & Nickel”.

The rare earth session comprised a series of lectures including the exploitation of overseas resources, the supply to Japan and the development and application of NdFeB magnet (rare earth magnet).

The nickel session consisted of international trends of the supply and demand, new Indonesian regulations for the ore exportation established in 2014, and the effective use of the low-grade nickel oxide ore which Japanese industry has treated.

The introduction of the Leading Program and the research activities by LP graduate student Mr.Hirose Teruji were announced in the final session.
III. International Symposium, Poster Session

A poster session was held in the international symposium of Akita session by LP students, as well as last year. All thirteen students run in their posters as listed below. The contents of most of the posters were based on their own research topics, and the progress in their studies was clearly observed. During the core time of the poster session, a large number of assembly gathered there, including lecturers and participants in the international symposium, and there was exciting debate throughout the session.

Poster Session by LP Students at Akita University

<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
<th>Supervisor</th>
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<th>Title</th>
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</thead>
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<tr>
<td>No.1 Ivan Setiawan</td>
<td>D2</td>
<td>Akira Imai</td>
<td>Economic geology</td>
<td>Petrology study of REE bearing granitoids at Panyabungan and its Surroundings, North Sumatra, Indonesia</td>
</tr>
<tr>
<td>No.2 Stephanie Saing</td>
<td>D2</td>
<td>Akira Imai</td>
<td>Economic geology</td>
<td>Ore bearing characteristics at the Pumagama high sulphidation deposit, Matarape, North Sumatra, Indonesia</td>
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<tr>
<td>No.3 Jenieal T. Padrones</td>
<td>D2</td>
<td>Akira Imai</td>
<td>Economic geology</td>
<td>Geochemistry and petrogenesis of the REE-enriched granitoids in northern Palawan (Philippines)</td>
</tr>
<tr>
<td>No.4 Wenhua Li</td>
<td>M2</td>
<td>Tsubayoshi Adachi</td>
<td>Mineral economics</td>
<td>Silver Supply Restriction for Sustainable Photovoltaic (PV) Installation</td>
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<td>No.5 Dnyelo Florence Sefemo</td>
<td>M2</td>
<td>Tsubayoshi Adachi</td>
<td>Mineral economics</td>
<td>Evaluation of Seal Central Expansion Project Using Real Option in BCL, Mine Botswana</td>
</tr>
<tr>
<td>No.6 Kegomoditse Koitswe</td>
<td>M2</td>
<td>Tsubayoshi Adachi</td>
<td>Mineral economics</td>
<td>THE IMPACT OF MINING SECTOR ON THE ECONOMY OF BOTSWANA: AN EMPIRICAL ANALYSIS</td>
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<td>No.7 Sandi Dwi Pratitwi</td>
<td>D1</td>
<td>Tukiuyi Sato</td>
<td>Economic geology</td>
<td>Collapse of the sea surface stability during the Mioocene to Quaternary in the Western Pacific Ocean, indicated by Dissipate abundance and ecological site change</td>
</tr>
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<td>No.8 Yusuke Inami</td>
<td>D1</td>
<td>Tsukasa Obha</td>
<td>Volcanology, Geology</td>
<td>Geomorphology and sedimentary features, and temporal component-change of lahars deposits at the northern foot of Chikui volcano, NE Japan</td>
</tr>
<tr>
<td>No.9 Reflwan Magwanowang</td>
<td>M1</td>
<td>Atsushi Shibayama</td>
<td>Mineral processing</td>
<td>Evaluation and Treatment of mine tailings: case study of sebebi kpitwe Cu-Ni mine tailings, Botswana</td>
</tr>
<tr>
<td>No.10 Baluq Han</td>
<td>D1</td>
<td>Atsushi Shibayama</td>
<td>Mineral processing</td>
<td>Copper Recovery from Mine Tailing Using Flotation and High Pressure Leaching</td>
</tr>
<tr>
<td>No.11 Pham-Ngoc Can</td>
<td>D1</td>
<td>Daiso Ishiyama</td>
<td>Geochemistry</td>
<td>Preliminary study about the Indium mineralization in the Na Bop and Long Hoai deposits, Cao Dien and Cao Dien mining area</td>
</tr>
<tr>
<td>No.12 Quyen Pham</td>
<td>M2</td>
<td>Daiso Ishiyama</td>
<td>Geochemistry</td>
<td>Enrichment of elements derived from Tamagawa Hot Spring, acidic thermal water, in man-made Tamagawa Dam, Akita Prefecture for recent 22 years</td>
</tr>
<tr>
<td>No.13 Teruji Hirose</td>
<td>M1</td>
<td>Hikari Fujii</td>
<td>Petroleum engineering</td>
<td>Relation between adsorption capacity and rock properties of silicous shales from the Onagawa Formation</td>
</tr>
</tbody>
</table>

International Symposium with a Partner Excursion / Post Symposium Excursion

A two days excursion was held after the international symposium. In the first day, we visited to the Kosaka Smelting and Refinery Plant of Dowa Metals and Mining, the Metals Technology Center (JOGMEC) and the Akita Prefectural Resources Technology Development Organization (Kosaka, Akita Prefecture). We also visited the JOGMEC Matsu Dn Metallization Plant and the Matsu Mine Museum (Hachimantai, Iwate Prefecture) in the next day.

The Kosaka Plant recovers gold, silver, copper and rare metals from the recycling materials such as discarded circuit boards, scrap, etc., utilizing a new type of refinery TSL (Top Submerged Lances) furnace.

The Matsu Dn Neutralization Plant treats the acid mine drainage from the abandoned Matsu Dn sulfur mine, situated in the headwaters of the Agakawa River, a branch of the Kitakami River (the biggest river in Tohoku region), using bacteria activities. It handles the drainage in following order. Collection of the drainage from the Matsu Mine’s basin, Distribution the drainage into each treatment section, Oxidation ferrous iron to ferric iron of the drainage by bacteria, Recovery of the bacteria, Neutralization the water with calcium carbonate, Solid-liquid separation, Sludge accumulation in the storage dam and Flowing clarified water. The final clarified water is over four in pH, and the facility treats nine million cubic meters of water a year.

The students report on the Kosaka Smelting and Refinery and the Matsu Neutralization Plant in the next page.
Kosaka Smelter and Refining Company Excursion／小坂製錬見学

Reflolwe Magwaneng／リフィルウィ・マグワンエング

Resource Development and Processing Course／資源開発素材コース

A day trip was conducted to Kosaka Smelter and Refining Company by five visiting professionals, two Akita university supervisors and three Leading Program students. A brief introduction was given about the Kosaka Smelter history and current status by Mr. Notomi (Standing Corporate Auditor) of the Company. The company dates back to 1884 when it operated to mining Cu-Pb-Zn deposit called "black ore"-Kuroko. What is impressive is that when it closed on mining it extended its operations to recycling materials such as rare earth metals. We were given a tour around the company’s plant area to observe the daily operations. In the summer of 2007, the company completed a new TSL (Top Submerged Lance) furnace, which boasts superior performance in processing recycled materials. Around the old grounds we had an opportunity to observe Kuroko mineralized ores to have been mined in the area. The company is an interesting site to visit for especially people in geo-resource science, because a lot can be learnt from its success.

Matsuo Neutralization Plant Fieldtrip／松尾銅山中和処理施設見学

Jenielyn Tuando Padrones／ジェニュエリン・トゥアンド・パドロネス

Earth Science and Technology Course／地球資源科学コース

A fieldtrip was conducted in Matsuo Neutralization Plant on September 26, 2014 following the fieldtrip conducted in Kosaka Smelting Plant. This activity was part of the Leading Program International Symposium of Rare-Metals and Resources. The group is composed of international delegates from USA (Dr. Fortier and Dr. Eggert), Mozambique (Dr. Jamal and Dr. Achim), Germany (Dr. Matschullat and Ms. Anne de Grobbois), Leading Program faculty members (Professor Mizuta and Associate Professor Kita) and Leading Program students (Ms. Li, Ms. Magwaneng and Ms. Padrones).

The Matsuo Neutralization Plant was a previous sulfur mine during the 19th century and have vibrant mining community of about 15,000 people. However, the operation ceased as a consequence of decreased sulfur demand and lower cost of sulfur as by-products of oil refining process. Despite its closure, the problem on acid mine drainage (AMD) from the abandoned mine continued and affected the rivers downstream leading to Miyagi and Iwate Prefectures. Thus, the treatment of the AMD started and eventually the neutralization plant was constructed.

The delegates visited the different facilities used in the treatment plant such as the permanent drainage channel, oxidation tank and bacteria recovering tank, neutralization tank, solid-liquid separation tank and plant storage dam. One of the unique feature of the plant is the use of iron-oxide bacteria, Acidithiobacillus ferroxidan, to oxidize Fe2+ to Fe3+ which enable the use of calcium carbonate which is cheaper than calcium hydroxide and other detergent.

Small stanniferous mines of the mine were part of the Kuroko mining area, which was famous for its copper, lead, zinc and silver deposits. The Kuroko mining area is located in the western part of the Japan Sea coast and was active from the 13th to 19th centuries. The mining operations were driven by the demand for these metals, particularly copper, for the production of coins, swords, and other goods. The mining activities left a significant impact on the local community, contributing to the development of a unique culture and way of life. The Kuroko mining area was designated as a World Heritage Site by UNESCO in 2015, recognizing its cultural and historical significance. The site is now a popular destination for visitors who are interested in exploring the history of mining and the unique cultural landscape of the region. The ongoing efforts to preserve and promote the site as a living museum highlight the importance of understanding and valuing the heritage of mining communities around the world.

The Matsuo Neutralization Plant storage dam where the sludge with pH 4-5 are kept, pH 4.5 is the optimum leaching for chalcocite and boulangerite in the Kuroko mining area.
Activity Report 1

Report on the Geological Survey of Mining Area in Northern Vietnam

水田敏夫／Toshio Mizuta

平成26年11月29日～平成26年12月11日の日程で、ベトナム国北部鉱床地域の調査研究を行った。ラオカイ市北部に位置するシンクエン地域の銅・金地域鉱床調査、周辺に位置する関連火成岩類の地質調査、また、ハギャン市北東部のナゾン鉱山の鋳地質調査である。参加者は、国際資源学部石山大三教授、LP大学院生Pham Ngoc Can氏、水田敏夫の3名である。

シンクエン(Syn Quyen)地域:シンクエン銅・金地域鉱床の調査を4日間実施した。周辺に位置する関連火成岩類の地質調査を行った。

ナゾン鉱山:ナゾン鉱山およびその周辺の3日間の調査を実施した。ナゾン鉱山は弱い変形作用を受けた流紋岩類中に脈状に産する鉱床である。銅、金および地質調査を行った。

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Ore Deposit Field Excursion in Canada / カナダ鉱床巡検

Pham Minh Quyen / ファム・ミン・クエン
Earth Science and Technology Course / 地球資源学科

From September 22 to 28, 2014, I had the chance to join a seven-day field trip that was sponsored by the Leading Program on volcanogenic massive sulfide deposits (VMSD) and Archean orogenic gold (Au) deposits in the Southern Abitibi greenstone belt along Quebec-Ontario border, Canada.

The Abitibi Greenstone Belt is one of the largest greenstone belts in the world. During the tour, I had the unique opportunity to visit underground and open pit mines that changed the life of thousands of people and the economy of the area about half a century ago. Based on discussion with professors, scientists, and graduate students from the Geological survey Canada, I understood how the Abitibi belt lithotectonic evolution controls the location and geometry of ore zones and the associated chemical and mineralogical diversity of mineralization and alteration assemblages. From the geological observation, we could understand that the formation time of VMSD were earlier than the age of orogenic Archean Au deposits.

Having the opportunity to see these world-class deposits and get firsthand knowledge on their complex geological setting in one of the most famous and best-exposed Archean Greenstone belts was an opportunity of my lifetime.

2014年9月22日〜28日までの期間、私はカナダケベック州からオンタリオ州にかけて分布するアピティビ・グリーンストーン帯で始生代の火成性塊状硫化物鉱床（VMS）と造山帯型金鉱床の見学を目的としたリーディングプログラム主催の巡検に参加する機会がありました。

アピティビ・グリーンストーン帯は、世界的にも大きなグリーンストーン帯の一つです。この巡検の中で、私は約半世紀前には多くの人々の人生とこの地域の経済的に大きく貢献した鉱山の坑内や露天の採掘部を訪問することができました。

カナダ地質調査所の教授とその共同研究者や大学院生らとの議論を通じて、私はアピティビ・グリーンストーン帯の地質構造発達のプロセスが、鉱化帯の分布と形態、鉱化作用や変質鉱物組み合わせの化学的・鉱物学的な多様性を制御してきたことを理解できました。地質学的観察から、この地域の火成性塊状硫化物鉱床（VMSD）が造山帯型金鉱床より先に形成されたことも理解できました。始生代グリーンストーン帯のなかでも有名で好煤類状況のアピティビグリーンストーン帯で世界的規模の巨大鉱床を見学できたこと、そして複雑な地質学的環境に関する知識をさらに深めてきたことは、私の人生においてひとつの良い機会でした。
We went on a field trip in Chile from November 14th to 27th, 2014, describing and collecting the samples of hydrothermally altered volcanic rocks from debris flow deposits. Active volcanoes are widely distributed in the vicinity of chilean eastern border. Because this area is an arid region with little covering by plant, surfaces of most deposits are clearly observed by aerial photograph. The hydrothermal alteration zone is exposed near the summit of the Cerro Toco volcano (ASL 5604m), and several lahar deposits are distributed on the volcanic flank.

Mr. Andrei and Mr. Jel.son accompanied this field trip, who are introduced from Prof. Kojima Shoji of Catolica del Norte University. By their help, we surveyed Cerro Toco volcano located 300 km east of Antofagasta where the university is located. The change in altitude between the two places is 5000m. Despite the blinding sunlight, it is bitterly cold near the summit. We observed and sampled (Fig. 1) largest debris flow deposit at two points on northern flank of the volcano. In addition, we collected samples from the hydrothermal alteration zone around the summit, in order to compare its composition with that of the debris flow deposit(Fig. 2).

The term of "debris flow" is defined as rapid flowing mixture of water and rock debris. The Atacama Desert's dry climate, how water is supplied? Other than sudden torrential rains, it could possibly derive from the subvolcanic hydrothermal system directly. That mechanisms is still unclear. In order to shed light on these issues, I would like to continue my research.
ラボサーキット演習 ／ Laboratory Circuit Training

福山薫子／Mayuko Fukuyama
大学院工学環境科学研究科工業化学専攻 臨時教授／Graduate School of Engineering and Resource Science Research Center for Engineering Science, Assistant Professor

本ラボレーティションは、岩石学の基礎と非岩石学における研究手法を理解することが目的です。岩石学は鉱物資源を理解するために必要な科学の一つです。本コースでは、鉱床探査や鉱床評価において必要となる岩石学の知識を教っています。コースは実習を主としており、次の6つの項目から構成されています：(1)岩石学の基礎、(2)偏光顕微鏡のための試料調製、(3)偏光顕微鏡を用いた薄片観察、(4)SEM（走査型電子顕微鏡）-EDS（エネルギー分散型X線分析装置）-CL（カソードラフィニング分析装置）の基礎、(5)全岩化学分析のための基礎的な試料調製法、(6)Q-ICP-MS（四重極型誘導結合プラズマ質量分析計）の基礎。コース終了時に学生は次のようなスキルを身につけることができます。

◎ 薄片中の主要造岩鉱物同定の実験能力
◎ 岩石中の鉱物の量と組織的情報を得るための操作技術

それぞれのスキルは、鉱物資源が関連するような項目の基礎的バックグラウンドとなります。

ラボサーキット演習 by Prof. Fukuyama／福山先生のラボサーキット演習に参加して

Stephanie Octorina Saing／ステファニー・オクトリナ・サイン
Earth Resource Science and Technology Course／地球資源学コース

I took this laboratory training last year. This class is very valuable in supporting my understanding and abilities about several basic research methods. I was in all training classes last year. The learning of petrological practical method is very helpful. The petrological analysis is essential for mineral evaluation and exploration. This laboratory training supports and helps my research much. I had no experiences before for practical research methods such as making thin section, analyzing with quadrupole ICP-MS and using SEM-EDS-CL. After joining the laboratory training, I am able to perform better in preparing my research methods, especially in making thin section and working with ICP-MS. Making thin section was difficult for me, but the lecturers help much for that. After the training, we are also allowed to ask sensei further anytime about the practical method that we had in laboratory training. It is also very helpful. The practices during the class help me to finish my research analyses and perform well the following interpretation. In my opinion, the laboratory training should be held every year for giving students overview about the research method and its practices, so they will be helped to do their own research, especially mineral exploration.
Batnasan Altansukh, PhD / バトナサン・アルタンスック博士 (工学)

Postdoctoral researcher, Mineral Processing & Metallurgy for Resource Recycling, Department of Applied Chemistry, Graduate School of Engineering and Resource Science, Akita University, Japan / 秋田大学大学院工学資源学研究科 矿物資源再資源化研究センター 博士研究員

I got my PhD degree in Engineering from Tohoku University, Japan in 2011. Nearly 2 years have passed since I started working at the Department of Applied Chemistry, Akita University as a postdoctoral fellow. My main duty is to develop an innovative economically viable hydrometallurgical process for treating natural ore and secondary resources to recover high purity precious and rare earth metals, while minimizing potential environmental impacts. I also have a responsibility for giving research and academic advisement on the mineral processing and hydrometallurgical process for students in Prof. Shibayama’s laboratory. There are 3 students of the leading program at the laboratory.

At present, my research interests focus on the 2 topics: Recovery of gold and silver from printed circuit board waste using alternative leaching agents and activated carbon adsorption, Dissolution of rare earth elements from Mongolian REE deposit in a diluted sulfuric acid solution.

For further implementation and achievement of the leading program, I will emphasize more on my active to motivate students to commence a personal exploration toward their research and to help them to obtain a wide range of knowledge and skills in the interdisciplinary fields of mineral processing and recycling. I believe that the best way to learn is to teach and continue to learn throughout life.

Adomako Ansah Kofi, PhD / アドマコ・アンサ・コフィ博士 (工学)

Postdoctoral researcher, Center for Engineering Sciences, Graduate School of Engineering and Resource Sciences, Akita University, Japan / 秋田大学大学院工学資源学研究科創成理工学研究センター 博士研究員

Hi! I’m Kofi from Ghana. I’m a Leading program postdoctoral research fellow. My research interest is economic geology. In addition to supporting the leading program with research guidance to its graduate students, I also conduct my own geo-scientific investigations on mineral deposit systems in the field of economic geology, with implications for ore genesis modeling, exploration targeting and environmental monitoring. My research works involve carrying out petrographic studies, combined with EPMA, XRD, PIXE, AAS, ICP-MS and LA-ICP-MS, fluid inclusion microthermometry and isotopic studies to discuss the geology, mineralogy, geochemistry and genesis of the mineral deposit systems under investigation. My current geo-scientific investigations include: (1) Carbon-Oxygen-Strontium-isotope and ICP-MS studies on carbonates and Oxygen-isotope study on quartz from gold-bearing banded iron formation deposits in the Amalia-Kraipan greenstone belts of South Africa. (2) mineralogical and geochemical characteristics of Bolden gold-rich volcanic-associated massive sulfide deposit, Skellefte district, Sweden.

I am grateful to Akita University for the opportunity to continue the geo-scientific investigations under the Leading program. The opportunity to visit research institutes/universities and world-class deposits for research has sharpened my knowledge further on the application of various approaches to understand complex geological terranes and mineral deposit systems.

研究紹介

Research Introduction
From August 17 to November 13, 2015, I had the unique opportunity to work at Akita University as a guest professor on sabbatical leave from TU Bergakademie Freiberg. It was my fifth visit to Akita since 2011 and yet, it was all new. To visit a place and see it for a few days or to be there for many weeks certainly makes for a substantial difference — and I am more than happy for this most insightful and enriching experience.

Teaching several modules in the leading program (Resource Science), including the performance of a practical field course did not only provide for a much more intensive interaction with the international group of students, but led to mutual sympathy and engagement beyond the average. And to experience highly engaged colleagues of Akita University working with the Master and PhD students again impressed my and nurtured ideas for further development, pointing out specific strength and also weaker aspects.

The Leading Program doubtlessly deserves further development and growth, since it provides both science and industry with urgently needed smart minds that can contribute to the urgently needed competence to develop a much more material and energy-efficient exploitation and processing of mineral and energy resources.

私はフライベルク工科大学のサバティカルリーブで、2014年8月17日から11月13日まで秋田大学の客員教授として働くことができた。2011年以来この秋田の訪問は5回目だが、全てが新鮮だった。数日から数週間におわたる現地訪問でたくさんのことがあった。この洞察に満ちた豊かな体験に、私は十二分に満足している。

実践フィールドコースを含むリーディングプログラムのいくつかの集中講義（資源科学）で教えていたが、学生たちとの非常に濃厚なふれあいのみならず、通常以上の相互理解・結びつきをもたらしてくれた。さらに、秋田大学の修士・博士課程の学生に熱心に指導している同僚教員たちにまた感謝を受けて、長所・短所を洗い出して、さらなる成長のためのアイデアをはぐくむことができた。

リーディングプログラムは、より多くの素材開発、エネルギー効率の良い鉱物やエネルギー資源の開発や処理のために、緊急に必要とされている競争力に役立つ賢明な思考を科学・産業界に供給しており、さらに発展・成長する価値のあるものであることは間違いない。
As being related to the field of education, enhancement of knowledge and skills are very much required and back from the days of my early education I had a dream to specialize in my field of interest. Leading program provides all the opportunities for improving knowledge through professional teaching and training programs, and I consider myself very fortunate for being a part of it. After finishing my studies I know it will be very beneficial for my institute as well as for my area where we lack such expertise and knowledge. It is also helpful in updating our current knowledge about the newly advancements in the resource field through global program approach.

Muhammad Zain Tuakia
Earth Resource Science and Technology Course

At the end of my master course in Bandung Institute of Technology, Indonesia, Prof. Akira Imai offered me the opportunity to continue doctoral program in earth resource science under Leading Program in Akita University. I totally agreed with him and took this opportunity. Currently, I am in Akita University.

As one of my destination country for study, I have easily adjusted the culture of Japan, especially Akita winter and Japanese language that I have to learn. As a Leading Program student, I am learning a lot of knowledge not only related to earth resource sciences but also sociocultural and management of technology, and sit together to build link with student from several countries in Asia and Africa. These are big opportunities for me that I didn’t imagine before. The program is enriching me to be a global leader in rare metals and resources as it is main purpose and preparing me to be ready as contribution to Indonesia (my home country) after graduation.

Kegomoditswe Koitsiwe
Resource Development and Processing Course

I am very honoured and grateful to have been selected as a recipient of IBEC 2015 best paper award (Economics Category). First of all, I would like to thank the organisers of IBEC 2015 for the award. I would like to express my deepest and sincere gratitude to my supervisor Prof. Tsuyoshi ADACHI for his immeasurable amount of support and guidance. Also, I am grateful to my colleagues for their helpful discussions, encouragement and invaluable comments. I would like to acknowledge the Akita University Leading Program for the support and opportunities to attend conferences. I hope that the award will motivate me to do better in my PhD research.
### 活動記録

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### 編集後記

北 良行 / Yoshiyuki Kita
Associate Professor with Special Appointment to the Program

秋田大学レアメタル等資源ニューフロンティア養成プログラムのニュースレター第1号が発行されたのは2年前の2013年3月で、プログラム採択第1号のこともでした。このニュースレターにはプログラムスタート時の関係者の意気込みが熱く語られ、その後、多くの活動やプログラム参加の学生の自己紹介など掲載してまいりました。報告する内容も若干充実し、今回で第6号となりました。私は2013年10月からプログラムに教員として参加しておりますが、今後もより多くの活動に尽力したいと思います。多くの学生が社会に就職することを願っております。

秋田大学リーディングプログラムのニュースレターは、2013年3月に第1号が発行され、現在までに6号が発行されています。このニュースレターは、プログラムの活動、学生の自己紹介、各種情報など、さまざまな情報を掲載しています。今後も、より多くの活動に参加し、学生の成長をサポートしていきます。

The first newsletter of the Rare Metals Resources New Frontier Training Program of Akita University was published two years ago, in March of 2013, just after the adoption of the program. There is much enthusiasm in the newsletter by the concerned person who involved with the program at its beginning. Many students have also contributed to publish about the program’s various activities as well as their introductions afterwards. This publication is now the sixth newsletter and the contents have also become increasingly substantial. While I have been participating as a faculty member of the program since October 2018, I would like to further devote my energies to the project. I am praying that many top-tier students will set out from here to serve in society.

【発行者】

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