Graduate School of
Integrated Sciences for Global Society
Kyushu University
九州大学大学院 地球社会統合科学府
ISGS

2015 Integrated Sciences for Human Era

人類紀統合科学

Invitation Period

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Invitation Team

Jay Quade (University of Arizona)
David Dettman (University of Arizona)

Vol.02

Advanced Global Training Project for
Integrated Academic Education
統合的学際教育を基盤とする
高度グローバル人材養成プロジェクト

九州大学
KYUSHU UNIVERSITY

はじめに

プロジェクト統括長
古谷　嘉章

地球社会統合科学府では、学府改組にあわせて、平成26年度に概算要求特別経費採択課題「統合的学際教育を基盤とする高度グローバル人材養成プロジェクト」を開始いたしました。

地球社会統合科学府は、高度グローバル化社会への対応や我が国の国際競争力の強化に資することを期し、文理融合を含む統合的学際教育の推進、広い視野に立つ教養と専門性、異文化理解・協調のスキルなど、グローバル人材としての基礎的資質の涵養を掲げて発足いたしました。本プロジェクトは、このような「国際的に誇れる大学院教育システム」を強固な基盤の上に加速的に実現するために、新学府への改組と平行して申請を進め、採択されたものです。

これまでプロジェクトでは、学府の理念をさらに加速して実現する推進力をつけるとともに、九州大学全体の機能強化を果たすことを目的として、著名な海外研究者チームのユニット招へい、「外国語ライティング」「地球社会統合科学」など高度学際教育の実効性を担う教育システムの開発、部局研究者チームの海外派遣などを実施してきました。

プロジェクトの柱となる海外研究者チームの招へい事業においては、海外主要大学の著名な研究者をユニットで招へいして、国際セミナー・コロキウムの開催、学府生を対象とした特別講義・フィールドトリップを実施してまいりました。今後もひきつづき、本プロジェクトでは年間二・三チームのユニットを招へいすることとしており、国際的高度専門職業人・研究者の養成や学際性の高い教育グローバルネットワークの構築に資する事業であると確信しております。

これまでの海外研究者のユニット招へいの実績や成果を学内外に発信し、さらなる研究・教育の国際化推進に寄与することを目的として、報告書を発刊することといたしました。

本号では、2015年前期にアリゾナ大学地球科学教室よりお招きしたJay Quade教授とDavid Dettman博士によるセミナー、集中講義、国際ワークショップ、フィールドトリップについて報告致します。両氏は、高精度質量分析計を用いた放射性炭素年代決定などの分析地球化学を駆使し、米国での人類紀古気候研究を牽引する地球科学の権威であられます。招聘期間中は、最新の分析地球化学的研究についてご紹介頂くのみならず、凝集炭酸同位体分析などの技術的指導もおこなって頂きました。部局のみならず、大学全体にとって大変有益な招聘事業でありましたことを、この場を借りて御礼申し上げます。この招聘事業で生まれた学術交流・共同研究は継続・発展し、新たな展開に繋がっていくことが期待されます。

今後もプロジェクトでは、統合的学際教育を基盤として多様な研究分野における海外研究者の招へいを継続して行い、より強力に教育研究のグローバル化ならびに高度グローバル人材の養成を推進することにより、プロジェクトの目標達成に部局の総力をあげて尽力する所存です。

Introduction

Project Supervisory Chairperson
Yoshiaki Furuya

Our Graduate School of Integrated Science for Global Society has launched "the Advanced Global Training Project for Integrated Academic Education" as the officially adopted project for Special Funds in Budgetary Request to the MEXT Ministry in FY2014, in accordance with the reconstructing of the previous graduate school.

The Graduate School of Integrated Science for Global Society was inaugurated, and expects to contribute to the response to the highly globalized society and the strengthening of global competitiveness in Japan while fostering natural endowments as global human resources, such as the promotion of integrated academic education including fusion of humanities and sciences, education and expertise with a broad-ranging perspective, and the skills for cross-cultural understanding/cooperation, etc. This project aims to realize this "Graduate School Education System That Can Be Boasted About to the World" on a solid foundation. The application to the program along with the reconstruction toward the new graduate school was advanced and adopted.

So far, in the project, along with cultivating the propulsive force by speeding up to realize the principles of the graduate school even more, for the purpose of achieving functional enhancement of Kyushu University as a whole, the invitation of prominent oversea research teams as a unit, development of an educational system that bears the effectiveness of the advanced interdisciplinary education, such as "Academic Writing in Foreign Languages" and "Integrated Sciences for Global Society", and overseas dispatch of the team of researchers of the departments have been conducted.

During the invitations of overseas research teams as the pillar of the project, we hosted multiple teams of prominent overseas researcher in a unit annually, held international seminars/colloquiums and conducted special lectures/field trips targeting the graduate school students. We believe that it contributes to foster international advanced professionals/researchers and construct a highly interdisciplinary educational global network.

We decided to publish the report for the purpose of dissemination of the performance and results of the invitations of overseas researchers, thus far, both inside and outside of the graduate school and the contribution to promote internationalization of further research and education.

In this issue, we would like to report the seminar, intensive course, international workshop and fieldtrip undertaken by Professor Jay Quade and Dr. David Dettman, who were invited from the Department of Geosciences, the University of Arizona in the first term of 2015. Both persons are the authorities of Earth science that lead integrated sciences for the human era in the United States by utilizing analytical geoscience such as radioactive carbon dating that uses a highly precise mass spectrometer. During the invitation period,

they not only invited the latest analytical Earth science research, but also performed technical guidance for carbonate clumped stable isotope analysis, etc. Please allow me to take this opportunity to express my gratitude, as the invitation was significantly beneficial for not only the departments but also for the entire university. We expect that the academic exchanges and collaborative research that were produced in this invitation will continue, develop, and lead to new developments.

In the future, in the project, by continuing to invite overseas researchers in various research fields based on integrated interdisciplinary education and promoting globalization of educational research and more vigorously fostering highly globalized human resources, we intend to make full-scale efforts for the achievement of the goal of the project.

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概　要

狩野　彰宏（比較社会文化研究院　環境変動部門）

アフリカ大陸で進化した人類は過去２万年間に気候条件の異なる世界各地に拡散してきた。地質学的には北半球の気候変動が顕著になった約258.8万年前以降の時代を第四紀と呼ぶが、これは人類の拡散期とほぼ重なることから人類紀という言葉も使われるようになった。この時期、北半球での気候変動は次第に振幅を増し、人類に別の試練を与えてきたのだろう。そして最後の氷河期が終わった約1万年前以降の完新世で、文字や文明と呼べるものが誕生し、人類の歴史は濃密になる。文明の黎明期には、少なくとも北半球は今より暖かかった。完新世後期には気候は数100年周期で細かい寒暖を繰り返し、人間社会や文化に影響を与えてきた。過去における人類と地球の関わりは、温暖化地球の中での人類の未来を考える鍵である。

この問題は、人類の文化的歴史と探求する考古学と地球環境の変遷を扱う地球科学が協力して取組むべき学際的課題である。そこで、特別経費プロジェクト「統合的学際教育を基盤とする高度グローバル人材養成」では、人類紀研究で世界的な業績を持つ研究者２名をアリゾナ大学地球科学教室から招聘し、教育・研究活動を行った。

Jay Quade 教授（招聘期間：5月22日～6月11日）はフィールドワークで世界中を飛び回る地質学者である。その一方で、高精度質量分析計により測定した放射性炭素年代を駆使し、米国での人類紀古気候研究を牽引してきた１人である。最近では^{10}Beの測定結果から過去の太陽活動の変遷を明らかにするなど斬新な成果も挙げつつある。 David Dettman博士（招聘期間：5月31日～7月11日）は分析地球化学に革新的な技術を導入した研究者である。彼が開発したマイクロミルシステムは古気候解析の解像度を大幅に改善した。また、本学府で取組んでいる凝集炭酸同位体温度計においても研究経験を持つので、技術的知識も豊富に持つ。

Outline

Akihiro KANO
(Facility of Social and Cultural Studies, Department of Environmental Changes, Kyushu University)

The human race that evolved on the African Continent has spread out to various places around the world under different climate conditions in the past 20,000 years. While, in geology, the era that followed approximately 2,588,000,000 years ago when the climate changes in the northern hemisphere became remarkable is called the Quaternary period, the term Human Era has come to be used, as such an era coincided, almost exactly, with the spread of the human race. During that period, the climate changes in the northern hemisphere gradually increased, which would have presented another challenge. Then, in the Holocene epoch approximately 10,000 years ago, when the last glacial period ended, something that can be called letters and civilization emerged, which made the history of human race dense. During the dawn of civilization, it was at least warmer than at present in the northern hemisphere. In the late Holocene epoch, the climates repeated minute changes in temperature in several hundred-year cycles, which have had an impact on human society and culture. The relationship between the human race and Earth in the past is the key to consider in regard to the future of the human race in the face of global warming.

This issue is an interdisciplinary one that should be tackled through the cooperation of archaeology that researches the cultural history of the human race and Earth science that deals with the changes in the global environment. Accordingly, in the special expenditure program, "The Advanced Global Training Project for Integrated Academic Education", we invited two researchers that have world-class performance in Human Era studies from the University of Arizona's Department of Geosciences and conducted educational and research activities.

Professor Jay Quade (the invitation period: from May 22 to June 11) is a geologist that travels all over the world for fieldwork. On the other hand, by utilizing radioactive carbon dating that is measured by highly precise mass spectrometer, he is one of the researchers that has led Human Era paleoclimate research. Lately, he has been obtaining innovative results such as clarification of the changes in solar activities in the past from the measurement results of ^{10}Be. Dr. David Dettman (the invitation period: from May 31 to July 11) is a researcher that has introduced innovative technologies to analytical Earth science. The micro-mill system that he developed has significantly improved the resolution of paleoclimate analysis. Additionally, as he also has research experience in carbonate clumped isotope thermometry, he has plenty of technological knowledge about it.

研究者プロフィール
Researcher Profiles

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Jay QUADE

: Professor, Department of Geosciences, the University of Arizona

Chronology of Education

1990	PhD, University of Utah

Chronology of Employment

1992 January	Assistant Professor, Department of Geosciences, University of Arizona, Tucson, Arizona 85721
1998 May	Associate Professor, Department of Geosciences, University of Arizona, Tucson, Arizona 85721
2003 August	Full Professor, Department of Geosciences, University of Arizona, Tucson, Arizona 85721

Some of his Publications

2013

Journal Articles (Research)

Quade, J, Eiler, J., Daëron, M., and Achuythan, H. 2013. The clumped isotope paleothermometer in soils and paleosol carbonate. Geochimica et Cosmochimica Acta 105, 92-107.

2011

Journal Articles (Research)

Quade, J., Breecker, D., Daëron, M., and Eiler, J. 2011. The Paleoaltimetry of Tibet: an isotopic perspective. American Journal of Science 311, 77-115.

J. Saylor, P. DeCelles, J. Quade. 2011. "Climate-driven environmental change in the Zhada basin, southwestern Tibetan Plateau." Geosphere, vol. 6, no. 2, pp. 74-92.

2009

Books (Research) – Edited

- Quade, J. and Wynn, J. 2008. "The Geology of Early Humans in the Horn of Africa." Geological Society of America Special Paper 446,.

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The University of Arizona
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David DETTMAN

: Manager of Environmental Isotope Laboratory, Geosciences Department, University of Arizona

Chronology of Education

Aug.1994	PhD. Department of Geological Sciences, University of Michigan
Aug. 1991	Master of Science, Department of Geological Science, University of Michigan
Aug. 1989	Master of Art, Department of History, University of Michigan
Aug. 1980	B.A. Medieval and Renaissance Studies, University of Michigan

Chronology of Employment

Aug. 2002 to present	Research Scientist, University of Arizona
July-Dec. 2009	JSPS Fellow, Kobe University
2003 to Aug. 2004	Research Professor, Shimane University
1995 to Aug. 2002	Senior Research Specialist, University of Arizona

Some of His Publications

2015

Journal Articles (Research)

- Dettman, D.L., D.R. Mitchell, G. Huckleberry, M.S. Foster, 2015, 14C and marine reservoir effect in archaeological samples from the north-east Gulf of California, Radiocarbon, v. 57, pp. 785-793.

2014

Journal Articles (Research)

- Fan Majie and D.L. Dettman, 2014, Hydrogen isotope measurement of bird feather keratin, one laboratory's response to evolving methodologies, Isotopes in Environmental and Health Studies, Vol. 51, pp. 1-17.
- Rooker, J.R.,, H. Arrizabalaga, I. Fraile, D.H. Secor, D.L. Dettman, N. Abid, P. Addis, S. Deguara, F.S. Karakulak, A. Kimoto, O. Sakai, D. Macías, and M. Neves Santos, 2014, Crossing the Line: Migratory and Homing Behaviors of Atlantic Bluefin Tuna. Marine Ecology Progress Series Vol. 504, pp. 265-276.