Date: 13 December 2018

JSPS US ALUMNI ASSOCIATION SEMINAR PROGRAM

REPORT

Organizer (Awardee)

Name: Lawrence T. Scott

Position & Affiliation: Professor (retired)/Adjunct Faculty, University of Nevada, Reno

1. TITLE OF SEMINAR

Chemistry for New Solar Energy Materials

2. DATE(S)

16 November 2018

3. VENUE & CITY, STATE

Schulich Lecture Hall 3, University of Nevada, Reno, Nevada

4. TARGETED RESEARCH AREAS

(1) New-generation Solar Cells (2) Nanostructured Materials (3) Nanographene Ribbons

5. NUMBERS OF PARTICIPANTS

TOTAL: 70 persons including 2 US Alumni Association members

-US: 69 persons

-FROM OVERSEAS: 1 person(s) including 1 person(s) from Japan

NOTES FOR REPORT

Executive Summary

The sun has always been mankind's ultimate source of energy. Plants capture sunlight and use its energy to convert carbon dioxide from the air into vegetation; herbivores eat plants, and carnivores eat other animals. The entire plant and animal kingdoms ultimately owe their existence to photosynthesis in plants. The coal, gasoline, furnace oil, natural gas, and other fossil fuels that we humans burn to meet our daily energy demands all came from organisms that lived eons ago. The wood we burn as an energy source is replenishable, but fossil fuels will eventually be exhausted. In anticipation of the end of the fossil fuel age, more and more scientists are turning their attention to the challenge of capturing solar energy and converting it to electricity or to chemical energy or to some other form of storable energy for later use. Silicon-base solar cells have been used for decades to power communication satellites, space stations, lunar exploration vehicles, pocket calculators, and numerous other electrical devices, but cheaper, more versatile alternatives would find many additional uses. This seminar focused on new materials being developed by chemists and chemical engineers for use in the next generation of solar energy capture and conversion.

Topics Discussed with Outcomes & Future Challenges

- Nanostructured materials for use in solar cells
- Photocatalytic processes
- Energy storage systems
- Synthesis and properties of nanographene ribbons
- Synthesis and properties of two-dimensional polymers
- Organic and inorganic-hybrid materials for new-generation solar cells
- Advantages of perovskite solar cells
- JSPS funding opportunities for students and faculty – The immediate outcome of this topic was discussions between Prof. Wakamiya and both Professors Chalifoux and King about their interest in collaborating and visiting Japan. The due date for application for trips in 2019 was already passed, unfortunately, so 2020 will be the earliest either visit could be arranged. One of the Ph.D. students also asked for more information about possible JSPS-funded postdoc positions. The biggest challenge seems to be the low visibility of the JSPS among American scientists and students. Seminars like this one are a good start on publicity. Perhaps the JSPS could pay for scientists from Japan to speak at scientific conferences in the US, too.

Workshop/Seminar Agenda

See next page

CHEMISTRY FOR NEW SOLAR ENERGY MATERIALS

University of Nevada, Reno
Department of Chemistry
Friday, November 16, 2018
Schulich Lecture Hall 3

Schedule

1:00 P.M.	**Lawrence T. Scott** Department of Chemistry, University of Nevada, Reno *Welcome and introductory remarks*
1:10 P.M.	**Vaidyanathan Subramanian** Department of Chemical Engineering, University of Nevada, Reno *"Nanostructured Materials for Solar Energy Utilization"*
1:50 P.M.	**Wesley Chalifoux** Department of Chemistry, University of Nevada, Reno *"Nanographene Ribbons: Ultrathin Nanowires"*
2:30 P.M.	**Break for refreshments**
2:50 P.M.	**Benjamin T. King** Department of Chemistry, University of Nevada, Reno *"Two-dimensional Polymers"*
3:30 P.M.	**Mio Yoshida** JSPS Washington, D.C., Office *"Japan Society for the Promotion of Science International Programs: Funding Opportunities for US Students and Faculty"*
3:45 P.M.	**Break for refreshments**
4:00 P.M.	**Atsushi Wakamiya** Institute for Chemical Research, Kyoto University, Japan *"New Generation Solar Cells Based on Organic and Inorganic-hybrid Materials"*

Photos

Back Row: Professor Vaidyanathan Subramanian, Professor Wesley Chalifoux, Professor Benjamin T. King, Professor Lawrence T. Scott. Front Row: Professor Atsushi Wakamiya, Ms. Etsuko Kifune.

Left to right: Professor Lawrence T. Scott, Professor Wesley Chalifoux, Professor Vaidyanathan Subramanian, Professor Benjamin T. King, Ms. Mio Yoshida, Ms. Etsuko Kifune, Professor Atsushi Wakamiya.