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NEWS REPORT

Young research investigators honored at the 2008 and 2009 Gordon research conferences on photosynthesis: ambiance and a personal perspective

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Abstract I provide here a personal perspective on (i) the awards that were given to young investigators at the 2008 and 2009 Gordon Research Conferences on Biochemistry/Biophysics of Photosynthesis; and (ii) the ambiance at these conferences through some photographs, particularly of the 2009 conference.

Keywords Ana Andrea Arteni · Libai Huang · André Klauss · Gary F. Moore · Tim Schulte · Jianzhong Wen

Introduction

Gordon Conferences on Photosynthesis have existed since 1969 (see http://www.grc.org/conferences.aspx?id=0000207 for a brief history and the list of past conferences). These conferences have been limited in size (from 100 to ~150) and are very intense with morning and evening sessions, as well as poster sessions in the afternoons with ample opportunity for one-to-one discussions during the afternoons and late evenings going past midnight sometimes. The program for the 2008 Conference is on line at: http://www.grc.org/programs.aspx?year=2008&program=photosyn.; and that for the 2009 Conference is at <http://www.grc.org/programs.aspx?year=2009&program=photosyn>.

Here, I provide a personal perspective on (i) the awards that were given to young investigators at the 2008 and 2009 conferences; and (ii) the ambiance at these conferences through some photographs, particularly of the 2009 conference.

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The awards

Three Young investigators were honored with awards at the Gordon Research Conference on Photosynthesis, held June 22–27, 2008, at Mount Holyoke College, South Hadley, Massachusetts, USA (Chair: Willem (Wim) F.J. Vermaas; Arizona State University, USA; Vice Chair: Douglas Bruce, Brock University, Canada).

The 2008 awardees were (in alphabetical order; see Fig. 1, the top photograph).

Libai Huang (Argonne National Laboratory, Illinois, USA); Gary F. Moore (Arizona State University, Tempe, Arizona, USA); and Jianzhong Wen (Washington University, St. Louis, Missouri, USA).

Again, in 2009, three young investigators were honored with awards at the Gordon Research Conference on Photosynthesis, held June 28–July 3, 2009, at Bryant University, Smithfield, Rhode Island, USA (Chair: Douglas (Doug) Bruce; Vice Chair: Krishna (Kris) Niyogi, University of California at Berkeley, USA).

The 2009 awardees were (in alphabetical order; see Fig. 2, the top photograph).

Ana Andreea Arteni (Commissariat à l'ÉnergieAtomique, CEA, Saclay, France); André Klauss (Freie Universität, Berlin, Germany); and Tim Schulte (Ruhr Universität, Bochum, Germany).

In 2008 as well as in 2009, the honored investigators were selected by a committee of session chairs based on a range of criteria including the novelty and quality of study, as well as technical and artistic aspects of the poster. In 2009, Roberta

Fig. 1 Photographs from the 2008 Gordon Research Conference on Photosynthesis. (*Top row*): *From left to right*: Douglas Bruce (Vice Chair), Libai Huang, Gary Moore, Govindjee, Jianzhong Wen, and Willem F.J. Vermaas (Chair). Huang, Moore and Wen were honored as young investigator awardees for the best posters. (*Bottom row*): *Left panel*: Govindjee and Alfred Holzwarth. *Middle panel*: An officer at the conference site and Elmars Krausz. *Right panel*: Robert (Bob) Blankenship eating the traditional lobster dinner

Croce (Groningen University, The Netherlands) served as the chair of this committee (Fig. 2, bottom row, left panel). In 2008 as well as in 2009, each of the young investigators was invited to present a seminar, based on his/her poster, in the Thursday evening session at the conference. All six presentations gave the audience a fascinating view of the exciting original research performed by the awardees. They all received full coverage of their conference registration. In addition, the author (G), the Series Editor of Advances in Photosynthesis and Respiration, Springer, personally presented a gift of one of the current volumes of his Series to each winner in recognition of his/her exceptional talent.

The awardees

I provide below brief statements about the academic background of both the 2008 and 2009 awardees; these are based on the statements written by the investigators themselves. I have arranged their names alphabetically.

Ana Andreea Arteni (2009)

Ana A. Arteni graduated in Biophysics, in 2001, from 'Alexandru Ioan Cuza' University in Iasi, Romania. For her Master's degree, she studied Optics & Spectroscopy, as well as Enzymology. She obtained her PhD in 2007 under Egbert J. Boekema's supervision, at the University of Groningen, The Netherlands. Her research focused on the structural determination of the protein complexes (Light-harvesting, Photosystem I and Photosystem II). Since 2008, she is a post-doctoral fellow in Bruno Robert's research group in Saclay, France, where she uses cryo-electron microscopy to improve the structural knowledge of phycobilisomes, in particular those from *Synechocystis* sp. PCC 6803. In parallel, she works on the spectroscopic characterization of whole *Chlamydomonas reinhardtii* cells and the structural changes accompanying the so-called 'State Transitions' or the build-up of the non-photochemical quenching (NPQ). The title of her Gordon Conference poster was: "*Structural organization of phycobilisomes and their interaction with the membrane*."

Libai Huang (2008)

Libai Huang received a Bachelor of Science, in 2001, from Peking University, Beijing, China, and a PhD in Chemistry from the University of Rochester (New York, USA), in 2006, for her thesis work on ultrafast and nonlinear optical properties of single-walled carbon nanotubes carried out

Fig. 2 Photographs from the 2009 Gordon Research Conference on Photosynthesis. (*Top row*): From left to right: Tim Schulte, Ana Andreea Arteni, Govindjee, André Klauss, and Douglas Bruce (Chair). Schulte, Arteni and Klauss were honored as young investigator awardees for the best posters. (*Bottom row*): *Left panel*: Jeremy Harbinson and Roberta Croce. *Middle panel*: Douglas Bruce (Chair) and Krishna Niyogi (Vice Chair). *Right panel* (speakers at the session on 'Type I Reaction Centers): Left to right: Alexey Semenov, Lisa Utschig, Kevin Redding and Shigeru Itoh

under the supervision of Todd Krauss. She was a postdoctoral fellow at the Argonne National Laboratory, Illinois, USA, with Gary Wiederrecht (Nanophotonics Group) and David Tiede (Photosynthesis Group), working on the application of ultrafast optical microscopy techniques for temporal and spatial resolution of primary events in photosynthesis. The title of her poster at the 2008 Gordon Conference was: "*Ultrafast Imaging of Solar Energy Flow in Photosynthesis*". Libai is now on the faculty of the Radiation Laboratory, University of Notre Dame (http://www.rad.nd.edu/faculty/huang.htm), where she is setting up a program on ultrafast imaging and spectroscopy in natural and artificial photosynthetic systems.

André Klauss (2009)

André Klauss studied Physics in Berlin and Madrid. He graduated (Diploma in December, 2007) in the laboratory of Holger Dau at the Freie Universität, Berlin (Germany), where he worked with an experimental technique called *Photothermal Beam Deflection* (PBD). This technique is related to photoacoustics and is able to monitor heat and structural changes during charge transfer reactions. André's diploma thesis dealt with applying, for the first time, PBD to the four S-State transitions of the manganese complex of Photosystem II (PSII). André continues as a PhD student in the laboratory of Holger Dau, where he is investigating the proton movements in synthetic as well as in biological systems by means of photothermal techniques. The title of his Gordon Conference poster was: "*Photosystem II water oxidation: Photothermal beam deflection reveals volume changes associated with proton movements*".

Gary F. Moore (2008)

Gary F. Moore obtained his B·S. degree from The Evergreen State College (in 2004). He received his PhD (in 2009) under Ana L. Moore, Thomas A. Moore, and Devens Gust from Arizona State University, Tempe, Arizona, USA, where he was a National Science Foundation fellow. Gary is currently working with the Green Energy Consortium at Yale University, New Haven, Connecticut, USA, as The Camille and Henry Dreyfus Foundation

Postdoctoral Fellow with the research groups of Gary W. Brudvig, Robert H. Crabtree, Victor S. Batista, and Charles A. Schmuttenmaer. His research efforts are focused on the design and assembly of bioinspired constructs for solar energy conversion. The intent of this study is to further enhance the understanding of energy flow in biological systems while using these insights to develop hybrid energy transduction schemes to meet human needs. The title of his 2008 Gordon Conference poster was: "*Proton Coupled Electron Transfer in a Bioinspired Mediator*."

Tim Schulte (2009)

Tim Schulte graduated from the Ruhr-University Bochum (RUB), Germany, with a M.S. in Biochemistry in 2006. Tim soon became fascinated with 'how protein structures are related to their function'. In the laboratory of Eckhard Hofmann, he became involved with X-ray crystallography to study the molecular structures of proteins. In his Master's thesis, he provided the X-ray structure of a soluble light-harvesting antenna that is unique to dinoflagellates; it was a high-salt variant of Peridinin-Chlorophyll *a*-Protein (HSPCP). His research, as a part of his current PhD work, is very well expressed by the title of his poster at the 2009 Gordon Conference: "*X-ray structures and transient absorption measurements of* in vitro *refolded Peridinin-Chlorophyll a-Proteins (PCP): Identification of one peridinin-sensing the Chl a excitation—Mapping Photosynthetic Function onto Structure*". Tim is looking forward to finishing his PhD next year in the Institute of Biophysics (Department of Biology and Biotechnology, RUB).

Jianzhong Wen (2008)

Jianzhong Wen received his B. S. in Physics from Wuhan University in China in 2004. He is currently a doctoral student of Robert E. Blankenship of the Department of Chemistry, Washington University in St. Louis, Missouri, USA. Jianzhong's goal is to understand how individual protein complexes, in photosynthetic systems, are built into a beautiful architecture to achieve efficient light-harvesting and energy storage processes. He uses chromatography, optical spectroscopy, and mass spectroscopy to achieve his goal. He has contributed to the discovery of the 8th bacteriochlorophyll *a* molecule in the Fenna–Mathews–Olson (FMO) antenna protein from green sulfur bacteria. Further, with his collaborators, he has shown how the FMO protein orients on the cell membrane. The title of his 2008 Gordon Conference poster was: "*Surface mapping of the FMO protein on the native membrane of Chlorobaculum tepidum by a combination of chemical modifications and mass spectrometry*".

The ambiance

Announcements, when accompanied by some photographs, always attract attention (see Govindjee, A.W. Rutherford and R.D. Britt (2007). Four young research investigators were honored at the 2006 Gordon Research Conference on Photosynthesis. *Photosynth. Res.* 92: 137–138; additional photographs are available at my web site at: http://www.life.illinois.edu/govindjee/g/Photo/Gordon%20Research%202006.html). Choice of photographs is a challenging job; it depends mainly upon their availability and, thus, it often becomes a random choice, with no offence to others, not shown.

In the bottom row of Fig. 1, I show three photographs of some of the participants from the 2008 conference. The left panel shows a photo of Alfred Holzwarth (Germany) and I at that conference; the middle panel shows Elmars Krausz (Australia) with an officer at the Mount Holyoke, who was very friendly toward all of us; and the right photograph is that of Robert Blankenship (USA) enjoying a lobster dinner, a tradition at the Gordon Conferences.

In the bottom row of Fig. 2, the left panel shows Jeremy Harbinson and Croce (as already mentioned above), the middle panel shows Doug Bruce (the chair) and Kris Niyogi (the vice chair, and chair-to-be for 2011) in their usual jovial mood (Doug usually laughs and Kris usually smiles); and the right panel shows speakers at the reaction center I session; I chose this group because, coincidently, it was also the birthday of one of the speakers (Alexey Semenov, from Russia, extreme left: Happy Birthday to you Alexey !); the 'fun' hats were provided by Kevin Redding (USA; see the back row; he was the chair of this session).

Figure 3 (top row, left and middle panels) shows some of the participants who were just gathering to join everyone else to get into the group photograph to be taken by the official photographer; and the right panel was extracted, and then modified, from the group photograph I had purchased from the Gordon Conference. The bottom row of Fig. 3 (left panel) shows Junko Yano (USA) and Johannes Messinger (Sweden) at the 2009 lobster dinner (Johannes is getting an extra serving); the middle panel shows Peter Jahns (Germany), Athina Zouni (Germany), the author (G), Junko Yano (USA) and Gennady Ananyev (USA); and the right panel shows Julian Eaton-Rye (New Zealand), Nicholas (Nick) Cox (Germany), the author (G) and Iain McConnell (USA); this photograph is dear to me since all of us, in this photograph, have been/are involved in understanding the role of bicarbonate (carbonate) in Photosystem II, my passion for the last 25 years .

An usual feature at these Gordon Conferences is a soccer game between the US and the Rest of the World (ROW); the 2009 game was organized by Gary Brudvig

Fig. 3 Photographs from the 2009 Gordon Research Conference on Photosynthesis. (*Top row*): *Left panel*: A group photograph shows, among others, in the front row: Su Lin (*blue jacket and light green sweater*); in the rows behind: Győző Garab (*grey hair, moustache and beard*), Peter Jumo Walla (*brown checkered shirt, wearing glasses*), Herbert van Amerongen (*looking up, wearing black jacket and sweater*), Gábor Bernát (*light-colored T-shirt*), Radek Kana (*black striped green T-shirt*) and André Klauss (*yellow T-shirt*). *Middle panel* shows among others (*left to right, in the front row*) Lisa Utschig, Ana Moore and Gary Hastings. *Right panel* (from bottom to top) : 1st row (left to right): Thomas Renger, Carolyn (Cara) Lubner, Douglas Bruce and Krishna Niyogi; 2nd row (*left to right*): Imré Vass, Fraser Armstrong and Fabrice Rappaport; 3rd row (*left to right*): Conrad Mullineaux, Klaus Lips, Thomas Moore, and John Golbeck; 4th row (left to right): Friket Mamedov, Jeremy Harbinson, and Alfred Holzwarth. (*Bottom row*): *Left panel*: Junko Yano and Johannes Messinger at the traditional lobster dinner. *Middle panel* (*left to right*): Peter Jahns, Athina Zouni, Govindjee, Junko Yano and Gennady Ananvev. *Right panel* (*left to right*): Julian Eaton-Rye, Nicholas (Nick) Cox, Govindjee and Iain McConnell

Fig. 4 Photographs from the 2009 Gordon Research Conference on Photosynthesis. (*Top row*): *Left panel*: Gary Brudvig of the US Team (*green shirt*) with soccer ball; next is William (Bill) Rutherford of ROW (Rest of the World) Team (*hat and green shorts*) dancing with soccer ball; the *insert below* is the game defended by the goalie GyőzőGarab of ROW (*in red shirt*, *on the ground with the soccer ball*); *Right panel* : Győző (*in red shirt*), successfully holding on to the soccer ball; the person kneeling down is Dave Tiede (Bottom row): *Left panel*: The late evening Music session: Bill Rutherford, Harry Frank and Mathew (son of Robert Niederman). *Middle panel*: Thomas J. Wydrzynski, Govindjee and Julian Eaton-Rye. *Right panel*: Left to right: Anthony (Tony) W.D. Larkum and Govindjee

(see Gary of the US Team in action in Fig. 4, top row, left); it also shows William (Bill) Rutherford (of ROW) in action at this soccer game; the inset shows the game; and the right top panel shows Győző Garab (of ROW) as the goalie, in clear action; ROW won this game; the player knealing down and seeking (though without success) for a "loose ball" is David Tiede (of the US Team). Győző is very proud that he was declared the MVP (Most Valuable Player) of the 2009 game. Another informal tradition at our conferences has been an evening of music by Bill Rutherford (France) and Harry Frank (USA) (see Fig. 4, bottom row, left panel); it also shows Matthews, Robert (Bob) Niederman's (USA) young son, joining in. It is a pleasure to show (Fig. 4, bottom row, middle panel) a photograph of two of my past PhD students: Thomas (Tom) J Wydrzynski (Australia), and Julian Eaton-Rye (New Zealand). I end this section on *Ambiance* with a photograph of Anthony (Tony) Larkum (Australia) since we were two of the 'senior' students in this gathering of '*photosynthetikers*' as Jack Myers would have called us. [A quiz for the future students of the 2011 Gordon Conference is: Who was Jack Myers and why we must remember him?]

Concluding remarks

We wish success to Kris Niyogi and Richard Debus, who will be the Chair and the Vice Chair, of the next Gordon Conference on Photosynthesis to be held in 2011. In 2010, however, we hope to see everyone at the 15th International Photosynthesis Congress to be held in Beijing, China, on August 22–27, 2010 (see its web site: <http://www.psbj2010.com/>). Their e-mail address is: ps2010@ibcas.ac.cn.

I thank Wim Vermaas and Doug Bruce for their help with the section on the *Awards*. For the description on the *Awardees,* I am grateful to Ana Andreea Arteni, Libai Huang, André Klauss, Gary F. Moore, Tim Schulte, and Jianzhong Wen for providing me information on their academic activities. I am especially thankful to Gennady Ananyev, Elmars Krausz, and Tony Larkum for the photographs. We thank Jacco Flipsen and Noeline Gibson, of Springer, for mailing the books for the 2009 awards to Doug Bruce, and Doug for bringing them all the way from Canada to the conference site!

I end these remarks by expressing my appreciation to Hans J. van Gorkom (The Netherlands), Charles (Charlie) Yocum (USA), A. William Rutherford (France), and Jun Minagawa (Japan) for valuable discussions on various aspects of photosynthesis at the 2009 conference.

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