Society for Invertebrate Pathology Newsletter

Volume 46 Issue 3 November, 2013

Looking forward to the
47th Annual Meeting of the Society for Invertebrate Pathology,
August 3-7, 2014 in Mainz, Germany

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From the President

Dear SIP Colleagues,

Looking forward and looking back. At SIP we have a strong tradition of drawing inspiration from our esteemed predecessors, who before us paved the way and inspired us. The more experienced amongst us also dare to hope that our work will inspire some younger scientists. The Founder's lecture is a tradition at SIP meetings that we should be proud of and maintain. We learn about significant science done within invertebrate pathology, presented by another leading scientist in the field. Then, at the recent annual meeting in Pittsburgh, we introduced, for the business meeting, a session about selected highlights of the year, suggested by Division Chairs and compiled and presented by Peter Krell and Stefan Jaronski. This session was highly successful and we all got an overview of some very recent trends in areas that we may not be personally familiar with. I sincerely hope we can establish this session as an annual tradition to complement the Founder's lecture.

A bit more about the Pittsburgh meeting: Really well organized and enjoyable, both with respect to science and socially. SIP is something special. A big credit to the organizing team, not the least: Nina Jenkins, Kelli Hoover and Matthew Thomas (all from Pennsylvania), and also SIP executive secretary Cecilia Schmitt. Besides being an excellent meeting, it also netted money into SIP, so we are doing well financially. Concerning memberships, we are also doing fine, with numbers increasing. Also, for those who did not recently visit our website, please have a look on our web page, where Leellen Solter and others have done a great job to compile, arrange and test a new look. Our Divisions are in good hands with enthusiastic chairs and committees are all functioning well.

Challenges we do, of course, have. We need to keep up membership, which will require continuous effort. Some regions in the world are poorly represented and we should encourage colleagues from those areas to attend. We should also do our best to convince our PhD's and post docs to continue their membership and to participate in the society, at least those who stay in invertebrate pathology.

For some of us, winter is coming. For me in Denmark this means four months with little daylight, cold and windy weather. Hmm, time to read some nice recent articles and books about invertebrate pathology.

My best wishes to all

2013 Student Award Winners

Mauro Martignoni Award to Scott William Behie

The goal of my research is to investigate the ability of insect pathogenic, endophytic fungi (EIPF) to transfer insect derived nitrogen to plant roots. I hope to elucidate the ubiquity of this important plant/fungal nitrogen transfer, as well as the transport mechanisms involved. The first aspect of this project was to initially determine the efficiency of *Metarhizium*, a ubiquitous EIPF, in transferring insect derived nitrogen to plants. The results were published in *Science* (June 2012). As there are numerous plant associating fungi from different fungal phyla, it was of interest to asses the evolutionary forces behind plant associative ability in distant fungal lineages. This led to another publication in *Communicative & Integrative Biology* in January 2013.

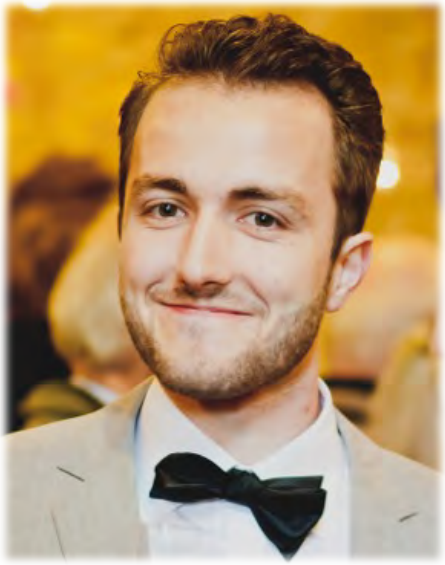
An important aspect of my current research is genetic manipulation of *Metarhizium*'s genome in order to discover the form of nitrogen that is transferred from the fungus to the plant root and there is potential for genetic manipulations to allow for stronger associations and higher levels of nitrogen transfer As there are numerous genes involved in not only nutrient transfer but also sustained fungal interaction, I co-wrote a paper discussing numeorus potential gene enhancements that could allow for a stronger and more beneficial plat/fungal interaction; this paper was published in *BioEssays* in January 2013.

The next aspect of my research will be to determine if there is a reciprocal relationship between the EIPF and the plant, where the fungus trades nitrogen to plant roots in exchange for plant derived carbon. This exhcnage has been shown in numerous obligate plant symbionts. A discovery of this type of relationship between EIPF and the plants they colonize would help to describe this enigmatic and important relationship.

1st: Oral Presentation Award to Diveena Vijayendran.

Title: A novel pea aphid antiviral defense strategy.

Diveena Vijayendran is a PhD student at Iowa State University, supervised by Dr. Bryony Bonning in the Department of Entomology. After completing part of her undergraduate studies in Malaysia, she transferred to the University of Northern Iowa where she received her BA in Biotechnology (Honors). Since her undergraduate research days, she has been very passionate about research in the areas of RNA interference and small RNAs. Her current research at Iowa State University involves studying novel aphid viruses and small RNAs for use in aphid management strategies. In addition to research, Diveena has a strong interest in teaching and she was recently awarded an Iowa State University's Excellence in Teaching Award. She hopes to become a faculty member in the future.



1st: Poster Presentation Award to Aurelién Chateigner
Title: How does AcMNPV virulence change following experimental evolution in different hosts?
Aurélien Chateigner is a PhD student working at the University of Tours (France) in the lab of Dr. Elisabeth Herniou, mixing molecular biology learnt at the University of Orléans (France) and intensive computation experienced at University of Cambridge (United Kingdom) to study the influence of the environment on the evolution of virus genomes. His research is to direct the evolution of a wildtype strain of AcMNPV in several host species and study the resulting phenotype and genotype. His goal is to understand the genetic changes that permit adaptation of a virus population to a particular host and the maintenance of a generalist potential. He was awarded a student travel award by the Virus Division of SIP in 2012 and 2013.

1st: Poster Presentation Award to Michael Goblirsch.
Title: A cell line resource derived from honey bee (*A. mellifera*) embryonic tissues.
Mike Goblirsch is a doctoral candidate in the Department of Entomology at the University of Minnesota advised by Dr. Marla Spivak. In collaboration with Drs. Tim Kurtti and Spivak, he generated a honey bee cell line that he is using to study interactions between host cells and intracellular pathogens thought to be responsible for the declining health of honey bee colonies. Mike has also been active in extension education through presentations to beekeeping groups, as well as outreach to the general public by teaching a basic beekeeping course and giving talks aimed at increasing awareness about pollinators.

2nd: Oral Presentation Award to Rousel A. Orozco.
Title: Nematicidal activity of crude extracts of the entomopathogenic bacterium *Photorhabdus l. sonorensis* on the root-knot nematode (*Meloydogyne incognita*) and the stem gall nematode (*Anguina pacificae*).
I have conducted research on characterizing bacterial secondary metabolites, bioactivity and bioprospecting of such compounds on plant pests and pathogens. I am also examining the transmission of bacteria symbionts in nematodes. Rousel was awarded first place for his oral presentation in Biological Sciences at the 2012 Emerging Researchers National Conference in STEM Conference, Atlanta GA.

3rd: Oral Presentation Award to Brian R. Lovett.
Title: Transcriptomic analysis of tripartite interactions of Metarhizium, Plasmodium, and *Anopheles gambiae*.
Brian Lovett is pursuing his doctoral degree in the Entomology department of the University of Maryland. He obtained a Microbiology BSc from Michigan State University. His PhD studies apply the latest transcriptomic and genomic approaches to agricultural systems and vector biology to further understanding of the role of *Metarhizium* in these fields. These studies aim to produce new approaches for manipulating the impact of this versatile fungus on plant roots and in mosquitoes.

3rd: Oral Presentation Award to Erin E. Morris.
Title: New associations between *Deladenus* nematodes, their *Sirex* hosts, and fungal symbionts.
Erin Morris received her BSc and MSc in Entomology at the Ohio State University in the United States. Her MS project, funded in part by a National Science Foundation GK-12 fellowship, focused on the use of entomopathogenic nematodes and fungi to control invasive Japanese beetles. Currently, Erin is a PhD candidate in Entomology at Cornell University in Ithaca, New York, working under Dr. Ann Hajek. Her dissertation research is about the numerous interactions between invasive *Sirex noctilio* woodwasps, their nematode parasites, and the symbiotic fungi with which the woodwasps kill pine trees. Methods used to investigate these interactions include the development of molecular identification techniques for parasitic nematodes, nematode reproduction assays, fungal culture, and phylogenetic analysis, as well as fluorescence and cryogenic scanning electron microscopy.

3rd: Poster Presentation Award to Chad A. Keyser.
Title: *Metarhizium* seed treatment improves conidial dispersal via roots and induces infections in root-feeding insects.
Chad Keyser is currently a PhD student at the University of Copenhagen in Denmark. His research project, directed by Nicolai Meyling, aims to clarify how *Metarhizium* spp. isolates interact with plant roots and with insects associated with these roots. In 2010 Chad completed a Master's degree from Utah State University where he worked with Donald Roberts to develop a laboratory based selection process for identifying promising fungal biological control agents. As an undergraduate at Utah State University, Chad took a summer job as a lab/field assistant in an insect pathology lab where he quickly became fascinated by the complex interaction between pathogen and host; he is thrilled to have the opportunity to continue his education in this area and looks forward to a career in biological control.

Honorable Mention: Poster Presentation Award to Stian A. Clem.
Title: Characterization of the role of baculovirus sulfhydryl oxidases in virion morphogenesis.
Stian Clem is a senior at Manhattan High School in Manhattan, Kansas, USA. He has been engaged in research at Kansas State University for almost a year, investigating the function of baculovirus sulfhydyl oxidases, enzymes that are required for baculovirus replication. Stian enjoys working in biological research and is looking forward to studying mathematics in college. He spent part of the last five summers at Duke University taking mathematics-related courses. He enjoys volunteering in charity clubs and activities to help his community.

Honorable Mention: Oral Presentation Award to Ana Maria Vélez at The University of Nebraska.
Title: Inheritance of Cry IF resistance, cross resistance and frequency of resistant alleles in *Spodoptera frugiperda* (Lep.: Noctuidae).
Ana Maria Vélez is a postdoctoral researcher at the University of Nebraska-Lincoln with Dr. Blair Seigfried. She is currently working on two projects: 1) RNAi risk assessment measuring the effect of vATPase A dsRNA from *Diabrotica virgifera virgifera* on honey bees, and 2) *D. v. virgifera* Cry3Aa mode of action. In May 2013, Ana earned her PhD in Entomology from the University of Nebraska-Lincoln, characterizing Cry1F resistance in *Spodoptera frugiperda* from Pureto Rico. Ana earned her Master's degree in Entomology (2009) from the National University of Colombia, where she worked on *S. frugiperda* plant association and genetic differentiation of corn and rice strains in Colombia.

Honorable mention: Poster Presentation Award to Minori Sekiguchi
Title: Cross-resistance to a granulovirus, an entomopoxvirus and *Bacillus thuringiensis* of the smaller tea tortrix, *Adoxophyes honmai* selected for resistance to the nucleopolyhedorvirus of *A. honmai*.
Minori Sekiguchi is a Master's student at Graduate School of Tokyo University of Agriculture and Technology where she is studying under Professor Madoka Nakai. Her research is focused upon understanding the interactions between baculoviruses, entomopoxviruses and bacteria that drive pathogenesis in pests of tea.

Student Travel Awards

Nematode Division
Aerya Ulug at Adnan Menderes University (Aydin, Turkey)
Monique Rivera at Rutgers University (New Brunswick, USA)

Virus Division
Diveena Vijayendran at Iowa State University (Ames, USA)
Huachao Huang at the Wuhan Institute of Virology (Wuhan, China)
Aurelién Chateigner at the Université Francios Rabelias de Tours (Tours, France)

Bacteria Division
Ana Maria Velez at the University of Nebraska (Lincoin, USA)
Angel Casanova-Torres at the University of Wisconsin (Madison, USA)
Mahadeva Swamy at the Indian Institute of Horticultural Research (Bangalore, India)

Diseases of Beneficial Invertebrates Division
Gillian Hertlein at the Institute for Bee Research Hohen Neuendorf (Berlin, Germany)

Fungi Division
Se Jin Lee at the Chonbuk National University (South Korea)
Christian Montalva at the Universidad Austrai de Chile (Chile)

Microbial Control Division
Rebecca Heinig at Penn State University (State College, USA)

ARSEF Symposium speakers. Stephen Wraight, Jørgen Eilenberg, John Vandenberg, Richard Humber, Louella Castrillo, Don Roberts, Raymond St. Leger, Stephen Rehner.

Founders' Lecture in 2013

Bob Granados, the Founders' Honoree

Gary Blissard, the Founders' Lecturer

Bob Granados with the Chair of the Founders' Lecture Committee, James Becnel and Jørgen Eilenberg, President of SIP

Gary Blissard with James Becnel and Jørgen Eilenberg

New Dropbox for SIP Photos!

We are looking to include your photos from the annual meeting or events related to SIP in upcoming Newsletters. To make it easy, we have set up a Dropbox folder for uploading your photos. We can only use those that identify the people in the photos. So please provide that and any other information you would like included in the photo legend with the file name of the photos you upload. If you have more than a dozen photos to upload, please contact the Newsletter Editor at Eric.Haas-Stapleton@csulb.edu to get a unique Dropbox folder for your photos. Everyone else, please use the following link to the SIP Photo Dropbox: https://www.dropbox.com/sh/hvfqwm1cbvmjgp2/vkZRl5xtgy. Thanks to All! - Eric

SIP Council for 2013

SIP Council Meeting for 2013. Left to right: (Front) Eric Haas-Stapleton, Peter Krell, Leellen Solter, Jørgen Eilenberg; (Second) Kelli Hoover, Patricia Stock, Selcuk Hazir; (Third) Lorena Pasarelli, Ed Lewis, Stefan Jaronski, Elke Genersch, Susan Bjornson, Helen Hesketh and Juan Luis Jurat-Fuentes; (Behind the Lens) Surendra Dara.

Learning the plans for the upcoming annual meeting in Mainz, Germany.

Peter Krell is thrilled after hearing the details for the meeting in Mainz!

This meeting was first convened in 2007 by Professor Zihni Demirbağ in Trabzon and continues bi-annually. The 4th Enthomopathogens and Microbial Control Symposium was held this year on September 11-14 in Artvin, Turkey. It was organized by Dr. Nurcan Albayrak-İskender and her colleagues at Artvin Çoruh University, located in a mountainous region near the Georgian border. The meeting was held at the University Congress Center and was attended by about 100 participants from around Turkey and Georgia and eleven invited speakers from other nations. The international invited speakers were split among Turkish speakers in each session. They set the stage for the various topics, viruses (Zihni Demírbağ, Basil Arif, Johannes Jehle; Zhihong HU (Rose), Madoka Nakai, Mohammadreza Rezapanah; Umut Toprak), fungi (Jørgen Eilenberg, Tariq Butt, İsmail Demir and Serkan Örtücü), bacteria (Juan Ferre, Omer F. Algur and Fikrettin Şahín), nematodes (Selçuk Hazir, Edwin E. Lewis and Itamar Glazer) and microbial control (Şaban Tekin, Madea Burjanadze, Nurcan Albayrak İskender and Temel Göktürk). In addition to the scientific program, two congressman, the governor and mayor of the city, the rector of university, chairs of the departments of forestry and agriculture and several others attended the opening ceremony. After opening remarks, the meeting continued with scientific oral and poster presentations. The participants had an unforgettable time during the BBQ, banquet and excursion. The number of attendees is increasing with each meeting and is becoming more international in the Eurasia region. The meeting was sponsored by the Artvin Governorship, the Artvin Mayorship, Artvin Çoruh University, General Directorate of Forestry and by Ali Nihat Gökyiğit Vakfı Foundation.

Invertebrate Virus Discovery Using Next-Gen Sequencing

Next Generation Sequencing for Invertebrate Virus Discovery

-a practical approach

Sijun Liu and Bryony Bonning (Iowa State University, USA) provided a fascinating seminar during the Virus Division Business Meeting of the 2013 Annual Meeting of SIP on the application of next generation sequencing technologies for discovering novel viruses that infect invertebrates. Both are leaders in this field and gave an insightful introduction to differences in the sequencing technologies that are broadly used and recommendations for the efficient analysis of the voluminous data that comes from sequencing studies. With the decreasing cost of sequencing and increased uses for the resulting data, many investigators are beginning to jump into these technologies. In their seminar, Sijun and Bryony provided a clear path for acquiring and analyzing sequencing data that was well received and greatly appreciated by all attendees. Sijun and Bryony have kindly permitted us to post the presentation in the Additional Resources section of the Virus Division page of the SIP web site (http://www.sipweb.org/viruses/virus_resources.html). This posting includes additional information that was not presented at the seminar. So even if you attended the seminar, you'll likely learn something new!

Microbial Control Workshop at ESPOCH (Riobamba, Ecuador) May 6-17, 2013

There has been a proliferation of small biopesticide companies in Ecuador that is supported with a strong desire by the government and farmers to minimize the use of chemical pesticides. The cost of labor in Ecuador makes local production of microbial pesticides feasible and profitable to the producers. At the invitation of Escuela Polytecnica Superior de Chimborazo (ESPOCH; Riobamba, Ecuador) Stefan T. Jaronski, PhD conducted a two-week workshop on the development of microbial pest control agents at their campus. Covering the gamut of insect pathogens (viruses to nematodes), the workshop presented methods for discovery, isolation, selection, mass production, quality assurance, formulation, and delivery of these organisms to manage insect populations. The emphasis was to incorporate these agents into integrated pest management programs, rather than as stand-alone substitutes for chemical pesticides.

Attendees numbered 35 in the daily lectures and 20 in parallel lab sessions, and the people consisted of staff from the Instituto Nacional Autónomo de Investigaciones Agropecuarias (INIAP), students and faculty from several Ecuadorean universities, and staff from several Ecuadorean biopesticide companies. The lab sessions gave the attendees direct, hands-on experience with varied tasks such as isolation and culture of bacteria, fungi, and nematodes; methods for quantitative determinations of microbe concentrations and viability; steps in mass production especially of the fungi; creating useful formulations; optimal application methods.

The 5K Race at the 2013 Pittsburgh, PA (USA) Meeting

The instructions are that the feet should occasionally touch the ground when you run or walk.

Dietrich Stephan recovering from the instructions session.

And they're ooooooofffffff !!

Michael Brownbridge and Jarrod Leland relaxing after their monumental sprint to the finish.

and the winners are.....

Winners of the 5K Race!

Women under 30: Eleanore Sternberg (1st), Gaelen Burke (2nd), and Gillian Hertlein (3rd).

Men under 30: Keir Balla (1st), Dominic Wiredu Boakye (2nd), and Jinzhi Niu (3rd).

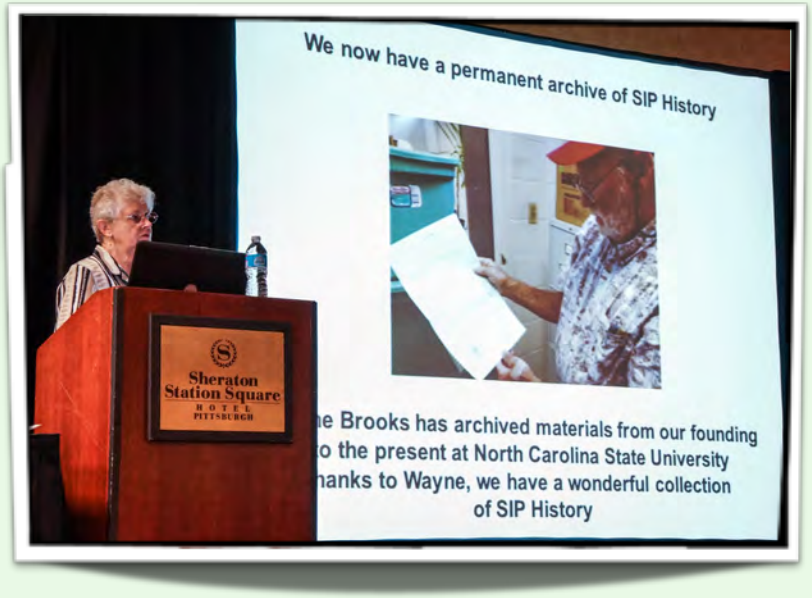
Women 30-45: Tarryn Goble (1st), Lyric Bartholomay (2nd), and Erin Morris (3rd) and Helen Hesketh (3rd).

Men 30-45: Brian Lazzaro (1st), Nicolai Meyling (2nd), and Cris Oppert (3rd).

Women over 45: Bryony Bonning (1st) and Joan Cossentine (2nd).

Men over 45: Neil Crickmore (1st), Ken Narva (2nd), and Dietrich Stephan (3rd).

Archive for the Records of SIP



The sustained efforts of Wayne Brooks, Betty Davidson and many others have resulted in a new archive for the Records of our Society at the University of Maryland, Baltimore County. These records date from the earliest days of the Society in 1967 when Edward Steinhaus was the President and are current with this issue of the Newsletter. This resource is freely accessible at: http://aok.lib.umbc.edu/specoll/SIP/index.php

We're republishing the inaugural Letter from the President on the next page. Enjoy this snapshot of our history and take the opportunity to explore our archive. There are bound to be photos that are sure to make some members cringe-- all just waiting to be rediscovered by you!

GREETINGS FROM THE PRESIDENT

Initiating a new scientific society "from scratch" is a difficult and frustrating undertaking at best. During these difficult times of world tribulation, rising taxes, increased dues of ongoing societies, increased printing costs, and even increased postage rates, such an effort might ordinarily be considered foolhardy. Fortunately, however, we have been blessed with the willing labor of dedicated men serving as members of your governing Council and as your officers, and backed by a small but steadily growing membership of scientists eager to promote the basic study of the phenomenon of disease in all its aspects in "animals without backbones." Accordingly, it is with confidence and enthusiasm that, in this first Newsletter and on behalf of the Society, I extend to each member our greetings and good wishes, and assure all of them that with their continued loyal support our course will surely be "onward and upward!"

In a manner similar to that currently used by the American Association for the Advancement of Science, your officers for the current term (until after the 1968 meeting) were elected by the governing Council. This Council evolved from an Organizing Committee selected by the votes of invertebrate pathologists responding to a questionnaire circulated early in 1967. The details of the response from the questionnaire, certain of the actions of the Organizing Committee (Council), and other information have been published in the June, 1967, issue of the *Journal of Invertebrate Pathology*, pages i-iv. The Organizing Committee voted, initially at least, to hold the new Society's annual meeting with the American Institute of Biological Sciences, of which it is an affiliate member, next September 3-7, 1968, in Columbus, Ohio. More information will be forthcoming concerning this meeting from the Chairman (John D. Briggs) of the Program Committee. In the meantime, with the diligent work and guiding hands of our Secretary-Treasurer, Arthur M. Heimpel, the Council has approved a Constitution which in turn has enabled us to become legally incorporated. Dr. Heimpel will keep the membership informed as to the method by which the actions of the Council are to be ratified by the full membership of the Society, and other details involved in our organizational procedures.

Although more will be said about these matters by others, in welcoming you to participate in the activities of the Society, I should like to emphasize that it is a Society devoted to the pathology (i.e., disease in its broadest definition) and microbiology of all invertebrate animals, that invertebrate pathologists from *any country in the world* are eligible for membership and to hold office, that the membership dues are only $4.00 per year, and that its activities are intended to be such as not to interfere or compete with those of any other society, association, or organization. By joining the Society for Invertebrate Pathology you can substantially aid in the promotion of "the scientific knowledge concerning the diseases of invertebrate animals and related subjects..." as stated in the opening passages of the Society's Constitution.

Edward A. Steinhaus
President

Remembrances

IN MEMORIAM: Clayton McCoy (1938-2013)

Clayton (Clay) William McCoy, Jr., 75, of Winter Park, FL, passed away October 4, 2013, in Orlando, Florida. He was born in Rochester, Minnesota, on June 22, 1938, and grew up on the family farm in Fairfax, Minnesota. He received a BS degree from Gustavus Adolphus College in 1960, an MA in Entomology from the University of Nebraska in 1963, and a PhD in Entomology in 1967 from the University of California at Riverside. Clay joined the Society for Invertebrate Pathology in 1970 as a full member and retained membership for more than three decades. He was among a very close group of UC Riverside in the sixties that included Pat Vail, Charles Reichelderfer, Ken Hunter, and others, all of whom made major contributions to the fields of insect pathology and insect microbial control. After graduating from UC Riverside, Clay moved to the USDA citrus laboratory in central Florida and initiated his research program on the citrus rust mite. After five years at the USDA, Clay began a long and successful career as a faculty researcher at the Institute of Food & Agricultural Sciences' Citrus Research & Education Center in Lake Alfred, Florida. He was the first recipient of the University of Florida's CREC's Distinguished Professorship in Research & Education. Clay retired from this position in 2005 after a 33-year career in research and education. Clay's special areas of focus were integrated pest management and the biological control of citrus pests.

His initial research program in Florida was directed at managing the citrus rust mite within a developing citrus IPM program. In concert with researchers at Abbott Laboratories, with lab director Terry Couch, Clay pioneered the development of Mycar, the first commercial mycopathogen registered for use in the United States against arthropod hosts. Clay's research program on Mycar involved studies that addressed fungal nutrition, biphasic production and formulation of inoculum, and application technologies and strategies. Clay received numerous awards and recognition in his career, including a United States Patent in 1994 for a bio-pesticide derived from a fungus and a USDA Honor Award (the agency's highest recognition for outstanding contributions to agriculture). During this period, Clay developed ties with insect pathologists, acarologists, and biocontrol and citriculture scientists on a global scale. In addition to the microbial control aspects, basic research on the fungus led to a systematic analysis of *Hirsutella thompsonii* biology and the discovery of the ribotoxin hirsutellin A.

In addition to his landmark achievements in the study of entomopathogenic fungi, Clay also made notable contributions to the field of entomopathogenic nematology. Specifically, he contributed substantial original research to the control of the *Diaprepes* root weevil – a significant and costly pest of citrus. He served as the coordinator the *Diaprepes* Task force for a number of years – serving the community of citrus growers, researchers, and students. Clay was instrumental in developing methods for using entomopathogenic nematodes (particularly *Steinernema riobrave*) to control *Diaprepes* on a commercial level. Clay's research

and teaching took him to all corners of the globe, whether to present at scientific conferences or to provide consultation to citrus growers and government institutions. However, he felt the most gratifying aspect of his career was his interaction with his colleagues, post-doctoral fellows, graduate students and research staff.

In his retirement, Clay co-authored the book *Pathogens Infecting Insects & Mites of Citrus* with colleagues Robert A. Samson, Drion G. Boucias, Lance S. Osborne, Jorge E. Pena, and Lyle J. Buss. He also demonstrated his love for the University of Florida Gators, rarely missing a football or basketball game, and he especially enjoyed walks with his dogs. The balance of his retirement involved traveling and spending time with family and friends. On August 24th, just six weeks prior to his death, Clay and his wife Lynne celebrated their 50th wedding anniversary with family and friends who came from all over the U.S. and the world to celebrate with them. His friends and colleagues will miss his generosity, kindness, and omnipresent smile.

In lieu of flowers, the family is requesting that donations be made to the Parkinson's Disease Foundation at www.pdf.org.

Drion Boucias, David Shapiro, Lawrence Lacey and James Maruniak
22 October 2013

Supreme Leader of the Meeting. Nina Jenkins is jubilant at the Opening Ceremonies.

Speakers and Organizers for the Symposium on Invertebrate Innate Immunity. (left to right) Bryony Bonning, Elke Genersch, Michael Kanost, Lorena Passarelli, Eric Loker and Jay Evans.

Division Chairs. (left to right) Lorena Passarelli, Elke Genersch, Selcuk Hazir, Susan Bjørnson, Stefan Jaronski, Helen Hesketh, Juan Luis Jurat-Fuentes.

The Presidents: Past, Current, and Soon-to-be. From left to right: Brian Federici (1996-1998), Mark Goettel (2008-2010), Leellen Solter (2010-2012), Donald Roberts (1988-90), Elizabeth Davidson (1990-1992), Just Vlak (2004-06), Jørgen Eilenberg (current), Harry Kaya (2002-2004) and Peter Krell (2014-2016).

Virus Division 2013. Left to right: (Front): Solange Miele, Peter Krell, Adly Abd-Alla, Gaelen Burke, Duan Loy, Diana Schneider, Aurélien Chateigner, Yatumasa Saito, Jörg Thomas Wenneman, Germain Chevignon, Martyna Krejmer, Gianpiero Gueli Alletti; (Second): Robert Granados, Basil Arif, Martin Erlandson, Zihni Demirbag, Lorena Passarelli, Diveena Vijayendran, Johannes Jehle, Just Vlak, Nor Chejanovsky, Carrie Hauxwell, Monique van Oers, Gloria Patricia Barrera, Paola Cuartas; (Third): Solange Miele, Yu Chan Chao, Renée Lapointe, Elisabeth Herniou, Jenny Cory, Madoka Nakai, Hsuan Tang (Sandy), Elke Genersch, Kelli Hoover, Holly Popham, Martin Andermatt, Amaya Serrano, Michel Cusson, ?, Xiao-Wen Cheng, Yoshifumi Hashimoto; (Fourth): Anne-Nathalie Volkoff, Bob Harrison, Chris Lucarotti, Gary Blissard, Kavita Bitra, Gaelen Burke, Diana Cox-Foster, Mariano Belaich, Jim Slavicek, Bryony Bonning, David Theilmann, Rollie Clem, Stian A. Clem.

SIP in Pittsburgh, 2013

Jørgen-E showing off the new SIP-slide-paper-pump dance move at the banquet.

Thank you to Kelli Hoover, Matt Thomas, Nina Jenkins and Cecilia Schmitt for giving their all to the meeting!

The Student Awardees looking pleased with checks in hand.

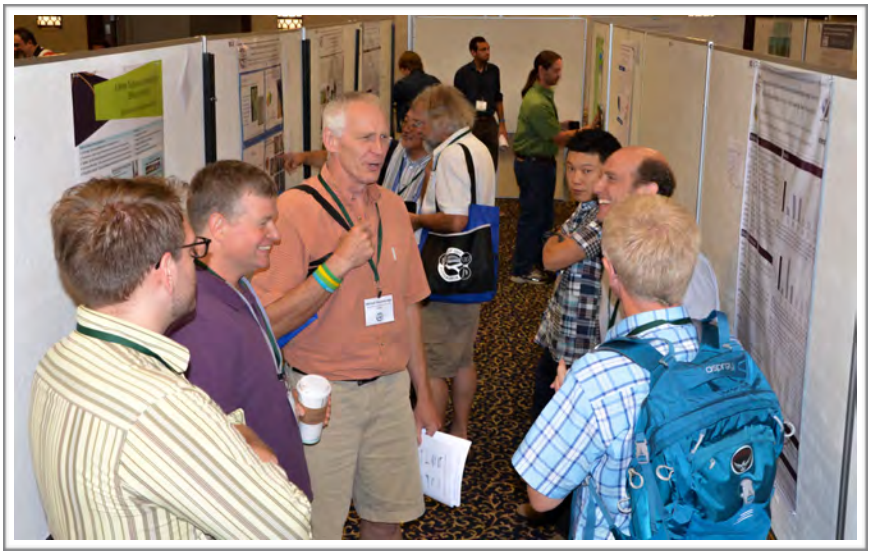
Artist (Patricia Stock) with patron (Mark Goettel) at the banquet!

Johannes Jehle introducing the venue for the upcoming meeting in Mainz, Germany. We're all looking forward to attending!

A coveted grand item for auction at the BBQ... where is it now?

Three cheers to Nina Jenkins for organizing an exceptional meeting in Pittsburgh!

Diveena Vijayendran about to get trampled by a *T. rex*.



Ganging up on a presenter during a poster session.

Bryony Bonning meeting the same fiendish beast!

Patricia Stock is all cheer at the banquet!

Onlookers gleefully anticipating the bloodshed.

Don Roberts and Ann Cali clear the floor!

Basil Arif and Patricia Golo enjoying the view on the BBQ dance floor.

Who is my advisor? .... oh, now I remember.

Jenny Cory and Elisabeth Herniou on the BBQ cruise.

Honey bee robbing the pollen basket of Ms. Bumble.

Helen Hesketh imagining Salvador Dali in the *Archerontia*.

The SIP'ers and dancers close the night again