Message from the Chair

Welcome to the Fall 2014 issue of the SEF Newsletter. With the arrival of Fall, we can begin looking forward to the AIChE Annual Meeting, to be held this year in Atlanta, Georgia. In addition to our usual offerings of excellent programming and our annual awards luncheon, the SEF and IfS will be hosting a joint reception in honor of the 10 year anniversary of the IfS. Be on the lookout for details as we finalize our plans for a great event celebrating 10 years of sustainability with AIChE.

In this issue, you will find the detailed program plan for SEF sponsored and co-sponsored sessions at the Annual Meeting. Also, be sure to check out the announcement of our SEF Award Winners, who will be recognized at our awards luncheon in Atlanta, as well as our usual listing of member announcements, educational briefings and IfS updates. Tickets for the awards luncheon will be available when you register for the Annual Meeting.

Dues paid by SEF members fund our operating expenses and outreach activities. In the last year, your dues have been used to sponsor two sustainability focused conferences - including the Foundations of Computer Aided Process Design Conference, held in Cle Elum, Washington, the 4th Annual International Forum on Sustainable Manufacturing, held in Lexington, Kentucky - as well as the Young professionals mixer at the 2014 AIChE Spring Meeting. Additionally, your dues have provided student research awards at the AIChE Annual Meeting and our annual student paper awards. I hope you will agree that opportunities to recognize the next generation of leaders in the field of sustainability are important.

In a volunteer based organization like the SEF, volunteers provide all the energy for continued momentum for the forum. If you are interested in getting involved, please e-mail me or any of the other members of the leadership committee listed in the newsletter. On behalf of the leadership committee, we look forward to welcoming many new volunteers to our organization.

Finally, your comments and suggestions on how to improve the SEF or serve our members better are always welcome. Feel free to contact me at Jeffrey.seay@uky.edu.

Jeffrey R. Seay
Chair, Sustainable Engineering Forum

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Editor:
Preeti Gangadharan
Technology Specialist
Bayer Technology Services
preeti.gangadharan@bayer.com

SEF Website:
http://www.aiche.org/sef
Announcements
By Ray Smith

SEF Luncheon - AIChE Annual Meeting, Wednesday, November 19th, 2014

The annual SEF luncheon will be held in Sear, located in the Marriott Marquis, Atlanta, on Wednesday, November 19th, 2014, during the AIChE Annual Meeting. Promising a main entrée with starch and vegetables, a salad, soft beverages, and dessert, the lunch will offer a relaxing setting to network with other SEF members while taking a break from the meetings. The SEF awards will be presented during the luncheon. The convenient location will enable the attendees to return to their scheduled meetings on time. The total cost of this SEF-subsidized event including tax and tip is $35. We encourage you to sign up for the luncheon when you register for the meeting.

U.S. NSF - China NSF Workshop on Sustainable Manufacturing Held in China

Initiated by the U.S. NSF and China NSF, the U.S. NSF - China NSF Workshop on Sustainable Manufacturing was successfully held in Wuhan, China, March 13-15, 2014. Drs. Bruce Hamilton, JoAnn Lighty, and William Chang of the U.S. NSF as well as a number of China NSF officers attended the workshop. The workshop was co-chaired by Prof. Yinlun Huang of Wayne State University and Prof. Xinyu Shao of Huazhong University of Science and Technology of China.

The workshop was targeted to identify high-priority specific research objectives that could be pursued significantly better by collaborative U.S. - China research teams than by U.S. researchers and China researchers working separately without U.S. - China collaboration. In the workshop, U.S. and China researchers defined high-priority sustainable manufacturing research objectives and discussed related collaborative research project areas that were potentially fundable jointly by the U.S. NSF and China NSF. The workshop was designed for broad and in-depth discussions of challenges, opportunities, and collaborations in critical areas of mechanical/chemical sustainable manufacturing. Participants from each country are leading/active scholars in mechanical, chemical, industrial, material, civil and environmental engineering. Thematic areas included (i) sustainable products and processes and (ii) sustainable manufacturing systems. These thematic areas covered most frontier research topics, such as product design innovations for resource efficiency and effectiveness, manufacturing process and equipment design with minimum ecological footprints, smart manufacturing, fast and in-time green production, and sustainable supply chain and industrial ecology. The workshop greatly helped U.S. delegates gain a clear understanding of research on sustainable manufacturing in China, and identify high-level collaboration opportunities with Chinese colleagues. As the workshop was designed for multidisciplinary discussions, it was targeted to lead to identification of cutting-edge areas in sustainable manufacturing and a plan for effective interdisciplinary collaboration.

The U.S. delegation was formed of 14 academic scholars of all ranks, including scholars from underrepresented groups. In specific, the workshop was co-funded by the Global Venture Fund (GVF) of NSF's International Science and Engineering section (ISE), as well as the CMMI and CBET divisions of NSF's Engineering Directorate.

Yinlun Huang
SEF Technical Advisor
SEF 2014 Awards
By Tom Marrero

2014 Sustainable Engineering Forum Student Paper Awards

Awards are presented to full-time undergraduate or graduate students who prepare the best technical papers that describe results related to engineering and sustainability.

2014 Student Paper Award Winner

Shweta Singh, William G. Lowrie Department of Chemical and Biomolecular Engineering, The Ohio State University, Columbus, Ohio


2014 Honorable Mentions

Sumesh Sukumara, Department of Chemical and Materials Engineering, University of Kentucky.

Dajun Yue, Department of Chemical and Biological Engineering, Northwestern University.

2014 Sustainability Education Award

The Sustainability Education award recognizes and honors one educator who has made outstanding contributions to sustainability education. Examples of contribution include, but are not limited to, successful incorporation of sustainability in the classroom or engineering community.

Helen H. Lou, Ph.D., P.E., University Professor and Ann Die Hasselmo Scholar Dan F. Smith Department of Chemical Engineering, Lamar University

Helen H. Lou is a Professor in the Dan F. Smith Department of Chemical Engineering, Lamar University. Her research focuses on sustainable engineering, process systems engineering, process safety and combustion. Dr. Lou was the Chair of AIChE Sustainable Engineering Forum (SEF) in 2010-11. She holds a B.S. in Chemical Engineering from Zhejiang University, Hang Zhou, China (1993), then worked four years in SinoPec Luoyang Petrochemical Engineering Corporation (LPEC). She received the following degrees from Wayne State University in Detroit, MI: an M.S. in Chemical Engineering (1998), an M.A. in Computer Science (2001) and a Ph.D. in Chemical Engineering (2001).

2014 Research Excellence in Sustainable Engineering Award

This award is annually presented for basic or applied research results relative to the sustainability of products, processes, or the environment. The award is to recognize one who has made significant technical contributions to teaching and development activities.

Prof. Phillip E. Savage, Department of Chemical Engineering, Pennsylvania State University

Phil Savage is Department Head and Walter L. Robb Family Chair in Chemical Engineering at Pennsylvania State University. He is also Arthur F. Thurnau
Professor Emeritus at the University of Michigan. Phil’s research deals with the elucidation of reaction pathways, kinetics, and mechanisms for systems with significance to the environment and environmental sustainability. His current focus is on hydrothermal processes for converting algal biomass into renewable chemicals and fuels. He has also developed and taught a graduate course on environmental sustainability and an undergraduate course on sustainable engineering. He is Editor-in-Chief of *Industrial & Engineering Chemistry Research*.

Phil obtained his B.S. degree at Penn State in 1982, and his M.Ch.E. and Ph.D. degrees from the University of Delaware in 1983 and 1986, respectively. He was at the University of Michigan from 1986 – 2014 and joined Penn State this summer.

**Prof. Vasilios Manousiouthakis, Department of Chemical and Biomolecular Engineering, University of California, Los Angeles**

Dr. Manousiouthakis is a Professor in the University of California, Los Angeles. His research interests include plasma simulation, process design, process optimization and process control.

Dr. Manousiouthakis obtained his Diploma at the National Technical University of Athens in 1981, his M.S. and Ph.D. degrees from Rensselaer Polytechnic Institute in 1985 and 1986, respectively.

**Programming Activities**

*By Sipho Ndlela*

The Sustainable Engineering Forum is thrilled to host 34 sessions gathered by an exceptional group of Chairs and Co-Chairs. The number of sessions is smaller this year as compared to 40 sessions at the 2013 annual conference. I think this gives the SEF team an opportunity to explore how we can bring in more talented faculty members and industrial experts to expand our sessions and increase collaboration.

This year’s annual AIChE conference in Atlanta will continue a tradition of enhancing professional development, networking opportunities and information exchange to all participants (faculty, professionals and students). Once again, my sincere thanks to everyone who made this program possible and for your support of the SEF programs. For more information about the upcoming conference, please visit: www.aiche.org. Below is a synopsis for the SEF session titles and scheduling.

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**Proposed SEF Sessions for the 2014 AIChE Annual Meeting in Atlanta, GA**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, November 17, 2014</td>
<td>12:30 PM - 03:00 PM</td>
<td>Marriott, International C</td>
<td>124</td>
<td>23000 Division Plenary: Sustainability Plenary</td>
</tr>
<tr>
<td>Tuesday, November 18, 2014</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International B</td>
<td>391</td>
<td>23A00 Nanomaterials and Nanotechnology Sustainability</td>
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<tr>
<td>Monday, November 17, 2014</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International B</td>
<td>39</td>
<td>23A01 Area Plenary: Optimizing Health, Safety &amp; Environmental (HSE) Sustainably</td>
</tr>
<tr>
<td>Wednesday, November 19, 2014</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International B</td>
<td>463</td>
<td>23A02 Process Design: Innovation for Sustainability</td>
</tr>
<tr>
<td>Date/Month</td>
<td>Time</td>
<td>Venue</td>
<td>Session Number</td>
<td>Session Title</td>
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<tr>
<td>Tuesday, Nov 18</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International B</td>
<td>287</td>
<td>23A03 Sustainability in Facility Siting</td>
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<tr>
<td>Tuesday, Nov 18</td>
<td>12:30 PM - 03:00 PM</td>
<td>Marriott, International A</td>
<td>324</td>
<td>23A04 Environmental Health &amp; Safety and Sustainability</td>
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<tr>
<td>Wednesday, Nov 19</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International C</td>
<td>591</td>
<td>23B00 Recovery of Value-Added Co-Products from Biorefinery Residuals and Effluents</td>
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<tr>
<td>Thursday, Nov 20</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International B</td>
<td>635</td>
<td>23B01 Integrated Thermochemical and Biochemical Processing for Renewable Fuels and Chemicals</td>
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<tr>
<td>Friday, Nov 21</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International B</td>
<td>752</td>
<td>23B02 Integrating Industrial Waste into Biorefineries</td>
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<tr>
<td>Tuesday, Nov 18</td>
<td>12:30 PM - 03:00 PM</td>
<td>Marriott, International A</td>
<td>298</td>
<td>23B06 Advances in Biofuels: DOE Bioenergy Research Centers</td>
</tr>
<tr>
<td>Thursday, Nov 20</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International B</td>
<td>424</td>
<td>23B04 Biological Conversions and Processes for Renewable Feedstocks II</td>
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<tr>
<td>Monday, Nov 17</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International C</td>
<td>196</td>
<td>23B05 Life Cycle Analysis of Bio-Based Fuels, Energy, and Chemicals</td>
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<td>Tuesday, Nov 18</td>
<td>12:30 PM - 03:00 PM</td>
<td>Marriott, International B</td>
<td>266</td>
<td>23B10 Conversion of Biomass Based Renewable Resources to Synthesis Gases and Pyrolysis Oils</td>
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<td>Wednesday, Nov 19</td>
<td>08:30 AM - 11:00 AM</td>
<td>Marriott, International C</td>
<td>604</td>
<td>23B14 Poster Session: Sustainability and Sustainable Biorefineries</td>
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<td>Thursday, Nov 20</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International A</td>
<td>757</td>
<td>23B15 Reactor Engineering for Biomass Feedstocks</td>
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<tr>
<td>Thursday, Nov 20</td>
<td>03:15 PM - 05:45 PM</td>
<td>Marriott, International C</td>
<td>718</td>
<td>23B16 Developments in the Pretreatment of Lignocellulosics for Bioconversion</td>
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<td>Thursday, Nov 20</td>
<td>12:30 PM - 03:00 PM</td>
<td>Marriott, International A</td>
<td>677</td>
<td>23B17 Chemical and Catalytic Conversions and Processes for Renewable Feedstocks</td>
</tr>
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</table>
As members of the Institute our work most likely focuses on processes related to the conversion of human activity. Therefore we are responsible for ensuring that we (that’s the collective “we” as in all of humanity) have and will continue to have sufficient water, energy, materials, and finished products to support a high quality of life.

Coupling this with the concept of sustainability, essentially the idea of creating conditions that will enable us to maintain conditions under which this high quality of life can be maintained to an indefinite future, Sustainable Engineering is therefore focused on the creative application of Sustainability Science on the design and improvement of technologies that will enhance our system sustainability by decreasing impacts of present activities or mitigating impacts of past activities. Clearly, sustainability forms a part of the ethical responsibility of engineering in general, and most of our innovation activities include some sustainability component, whether explicit, or implicit. For the upcoming AIChE annual meeting I would like to challenge you to clearly present the manner in which your work addresses sustainability.

For any comments or with ideas on what I can address in upcoming Education Columns, please contact me at alex.yokochi@orst.edu.
IfS Updates
By Darlene Schuster and Lucy Alexander

Enroll Today for the AIChE Credential for Sustainability Professionals
The AIChE Credential for Sustainability Professionals (ACSP) is being launched to offer practicing engineers, faculty and graduate students a specialized credential in sustainability. The program comprises an online self-assessment, 2 master level courses, and a capstone case study design project. The ACSP is now open for enrollment to all interested applicants. To register for the first class, take the prescreen assessment at: http://www.aiche.org/ifs/resources/sustainability-credentials.

Sustainable Packaging Cosmetics Roundtable (SPCR)
The Sustainable Packaging Cosmetics Roundtable (SPCR), with members from major cosmetics companies, organized under the Center for Sustainable Technology Practices (CSTP) of AIChE’s Institute for Sustainability, enters its third year of operation. SPCR members work with suppliers, retailers and customers to advance sustainable packaging. Their latest effort is the development of the Sustainable Materials Commodity Guide – a comprehensive list of packaging suppliers’ sustainability attributes. To browse corporate members of CSTP or to get involved, please visit: http://www.aiche.org/ifs/community/overview/corporate-members.

DOE Sustainability Metrics
AIChE’s Institute for Sustainability and Center for Energy Initiatives are developing a suite of sustainability metrics for manufacturing systems to be implemented in sensor data technologies being developed by the Smart Manufacturing Leadership Coalition (SMLC) and funded by a DOE grant to achieve energy productivity gains. Efforts are also underway to explore development of education modules with novel approaches using Cloud data storage and apps for real time engineering and process control for manufacturing. To learn more, please visit: http://www.aiche.org/cei/news/institute/07-31-2013/industrial-scale-demonstration-smart-manufacturing.

Members’ Column
By Cory Jensen

We are in a period of transformational growth with regard to membership services and community-support-content. Our membership committee has committed to putting a long-term strategic plan into action in order to support your needs as a member. We are also seeking out additional support and, of course, your input to make the SEF a high performing member segment of AIChE. For example, we are looking for education content that supports membership interests via our educational resources. If you think you have an idea to support web content we would like to hear about it!

As I continue to support concepts and applications of sustainable engineering, I wanted to share a tid-bit of information from GreenBiz.com (Figure 1) indicating that companies are spending money on corporate social responsibility activities (current buzz phrase). This trend suggests that employment opportunities exist that requires professionals with

Figure 1: Equivalent salary vs. % companies surveyed, in response to a poll of how much money companies are spending on corporate social responsibility topics.
unique soft-hard skill sets. 82% of companies polled spend money on these activities with a remarkable >50% reporting companies spent monies equivalent at least one full time equivalent employee making a decent living wage (> $40K/yr).

With that, I am leaving you with some sustainable transportation food for thought. Depending on the specifics of your calculation for a MPGe (miles per gallon gasoline equivalent), the Nissan Leaf and Chevy Volt have been reported to obtain MPGe in the mid 90 MPGe. My old Jeep Cherokee would consistently get under 20 (miles per gallon of gasoline) MPG. To help reduce my transportation costs, I rebuilt a two-cycle gas powered bicycle (Figure 2). My initial assessment of online media indicates I could expect to get 150 MPG!

**Become a Member**
Not a member of AIChe or the Sustainable Engineering Forum? In order to guarantee that you are on the current email list and will have access to all existing SEF materials, please follow the link and make sure that you join the SEF!
https://www2.aiche.org/SolutionSite/default.aspx?tabid=168&action=MBRProductDetails&args=35&aicheskin=aiche

We are an active group of 500+ members ranging from industry to academia. The diverse interests of our members have contributed to the range of activities which we offer through the forum. As a member, you will be placed on our e-mailing list and notified of upcoming meetings and events.

**Three Steps to Membership**
**Applicant’s Request for Membership**
1. Complete the SEF Application available online at:
www.aiche.org/DivisionsForms/ViewAll/SEF.aspx
   - REGULAR membership annual fee $20
   - STUDENT membership annual fee $10

Membership fee waived for full-time undergraduate or graduate students for two years provided that student is a paid AIChe member; otherwise, a $10 annual fee is required. Mail completed forms to:
   AIChE Customer Service,
   100 Mill Plain Rd 3rd Fl
   Danbury, CT 06811
2. Staff Review to ensure completeness of application
3. Membership - Welcome!

![Figure 2: Rebuild of a two-cycle engine](image-url)
# SEF Leadership 2014-2015

## Chair
Dr. Jeffrey R. Seay, Assistant Professor  
Department of Chemical and Materials Engineering, University of Kentucky  
4810 Alben Barkley Drive  
211 Crounse Hall, P. O. Box 7380  
Paducah, Kentucky 42002  
Phone: (270) 534-3299  
E-Mail: jseay@engr.uky.edu

## Vice Chair
Dr. Raymond L. Smith  
Office of Research and Development  
National Risk Management Research Laboratory  
Sustainable Technology Division  
Cincinnati, OH  
E-Mail: smith.raymond@epa.gov

## Treasurer
Dr. Cristina Piluso  
BASF Corporation  
1609 Biddle Avenue  
Wyandotte, MI 48192  
Phone: (734) 324-5463  
E-mail: cristina.piluso@basf.com

## Secretary
Dr. Ignasi Palou-Rivera  
Senior Process Engineer  
Lanzatech Inc.  
725-C East Irving Park Road  
Roselle, IL 60172  
Phone: (630) 336-5716  
Email: Ignasi.Palou-Rivera@lanzatech.com

## Programming Committee Chair
Dr. Sipho C. Ndlela  
Independent Consulting Engineer  
2904 Ross Road  
Ames Iowa 50014  
Phone: (515) 441-0988  
E-mail: sndlela@gmail.com

## Education Committee Chair
Dr. Alexandre (Alex) F. T. Yokochi  
Associate Professor  
School of Chemical, Biological and Environmental Engineering  
Oregon State University  
Corvallis, OR 97331 – 2702  
Phone: (541) 737-9357  
Email: alex.yokochi@orst.edu

## Membership Committee Chair
Cory D. Jensen  
College of Engineering & Computational Sciences  
Colorado School of Mines  
Golden, Colorado 80401  
Phone: (970) 219-5990  
E-mail: cojensen@mines.edu

## Awards Committee Chair
Dr. Thomas R. Marrero, Professor  
Department of Chemical Engineering  
University of Missouri-Columbia  
W2015 Lafferre Hall, Columbia, MO 65211  
Phone: (573) 882-3802  
E-mail: MarreroT@missouri.edu

## Technical Advisory Committee Chair
Dr. Yinlun Huang, Professor  
Department of Chemical Engineering and Materials Science  
Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-3771  
E-mail: yhuang@wayne.edu

## International Committee Chair
Dr. Aydin Sunol, Professor  
Dept. of Chemical and Biomedical Engineering  
University of South Florida  
4202 E Fowler Avenue, ENB 118  
Tampa, FL 33620  
Phone: (813) 974-3566  
Email: asunol@usf.edu
**SEF Leadership 2014-2015**

**Industrial Liaison**

Peter Knox  
EcoChem Strategies, a division of Knox Research & Publishing  
Phone: (626) 255-6462 (Mobile)  
E-mail: Peter.Knox@EcoChemStrategies.com

**Technical Areas:**

**General (Area 23a)**  
**Area Chair:**  
Dr. Eric Peterson  
Technical Process Safety & Risk, Manager  
MMI Engineering  
11490 Westheimer Rd Ste 150,  
Houston, TX 77077-6851  
Phone: (510) 836-3034  
E-mail: EPeterson@MMIEngineering.com

**Sustainable Biorefineries (Area 23b)**  
**Area Chair:**  
Dr. David Hodge, Assistant Professor  
Department of Chemical Engineering and Materials Science  
Michigan State University  
East Lansing, MI  
Phone: (517) 353-4508  
E-Mail: hodgeda@egr.msu.edu

**Sustainable Energy (Area 23c)**  
**Area Chair:**  
Dr. Fengqi You, Assistant Professor  
Chemical and Biological Engineering  
2145 Sheridan Road  
Tech  
Evanston, IL 60208-3109  
Phone: (847) 467-2943  
Email: you@northwestern.edu

**Past Chairs:**

**2012-2013:**  
Dr. David N. Thompson  
Biological and Chemical Processing  
Idaho National Laboratory  
P.O. Box 1625  
Idaho Falls, ID 83415-3750  
Phone: (208) 526-3997  
E-mail: david.thompson@inl.gov

**2010-2011:**  
Dr. Helen Lou, Professor  
Department of Chemical Engineering  
Lamar University  
Beaumont, TX 77710  
Phone: (409) 880-8207  
E-mail: Helen.Lou@lamar.edu

**2008-2009:**  
Dr. Yinlun Huang, Professor  
Department of Chemical Engineering and Materials Science  
Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-3771  
E-mail: yhuang@wayne.edu

**2006-2007:**  
Dr. Martin Abraham  
Dean, College of Science, Technology, Engineering, and Mathematics  
Youngstown State University  
Youngstown, OH 44555  
Phone: (330) 941-3009  
Email: martin.abraham@ysu.edu

**2003-2005:**  
Dr. Subhas K. Sikdar  
Associate Director for Science  
National Risk Management Research Lab/USEPA  
26 W. M.L. King Dr.  
Cincinnati, OH 45268  
Phone: (513) 569-7528  
E-mail: sikdar.subhas@epa.gov