

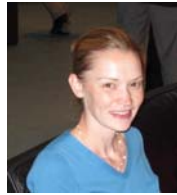
Summer 2009

UNIVERSITIES SPACE RESEARCH ASSOCIATION

# DSLS Newsletter

## Promotions, Honors and Awards!

**Sara Zwart, PhD**, was promoted to Senior Scientist and Deputy Manager of the Nutritional Biochemistry Laboratory. Sara joined the lab in 2003 as a National Research Council Post-doctoral Fellow, and became a DSLS Research Scientist in 2005. She holds a Bachelor of Science degree in Biological Sciences from the University of Notre Dame, and earned her Doctorate in Nutritional Sciences from the University of Florida.



*Sara Zwart, PhD*

**Camille Shea, PhD**, was appointed Element Scientist for the Behavioral Health and Performance Research Program. Camille joined USRA in 2008 as the BHP Program Manager and served as Deputy Project Scientist. She holds a Bachelor of Business Administration degree and a Doctorate in Clinical Psychology with an emphasis in forensic specialization.



*Camille Shea, PhD*

**Chris Westby** successfully defended his thesis at the University of Colorado at Boulder and earned his doctorate in Integrative Physiology in May, 2009. His

graduate work focused on studying the effects of Endothelin-1-mediated vasoconstrictor tone in a human aging model.



*Chris Westby, PhD*

**Rob Ploutz-Snyder, PhD**, accepted an appointment as Research Associate Professor in the Department of Medicine at SUNY Upstate Medical University, one of USRA's member universities.



*Rob Ploutz-Snyder, PhD*

**Ianik Plante, MD**, received the Faculty of Medicine Dean's Award for his PhD work at the University of Sherbrooke, Quebec, Canada. Further, Ianik successfully defended his thesis on Monte-Carlo simulations of the radiation chemistry of heavy ions and neutrons on July 9!



*Ianik Plante, MD PhD*

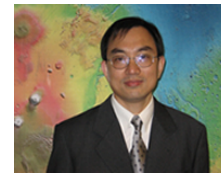
**Marguerite Sognier, PhD**, was recently honored twice: she received a Service Appreciation Award from the Ball High School Pathfinders Program, and a Tech Brief Certificate of Recognition "for the creative development of a

technical innovation for inventions that have helped NASA to achieve its aeronautical and space goals".



*Marguerite Sognier, PhD*

**Shaowen Hu, PhD** has been notified by the President of the Radiation Research Society that he will receive the



*Shaowen Hu, PhD*

**Fowler Award** at the organization's Annual Meeting in Savannah, Georgia, in October. The award recognizes an outstanding junior investigator for exceptional work in radiation oncology, medical physics, and/or radiobiology. Shaowen is also the recipient of a travel award for the same meeting.



*Zarana Patel, PhD*

**Zarana Patel, PhD** won **first place** in the poster competition at the 20th Annual Space Radiation Investigators' Workshop in Cologne, Germany. Zarana will also receive a Scholars-in-Training Travel Award for the Annual Meeting of the Radiation Research Society in Savannah, Georgia, in October.



**Congratulations, everyone!**

## Research Grants Awarded!

Houston C, **Sognier MA**: Career Connexx Program to expand the pipeline to STEM careers, selected for funding for three years by the National Science Foundation.

Houston C, **Sognier MA**: Teacher Professional Development: Key to Developing the Future Biomedical Workforce, selected for a two-year NIH Challenge Grant.

Stangel I, **Sognier MA**: Novel Treatments for Dental Caries, selected for a two-year NIH Challenge grant.

## Grant Proposals Submitted

Cohen H, Bloomberg JJ, **Mulavara AP**, Peters B, Paloski W: “Epidemiologic Research on Screening for Vestibular and Balance Disorders”, a supplemental proposal in response to the American Recovery and Reinvestment Act of 2009, NIDCD Administrative Supplements.

Lang T, Bloomberg JJ, **Mulavara AP**, Cavanagh P, Grodzinsky CM: “An Integrated Exercise Device to Preserve Musculoskeletal and Neurovestibular Function in Elderly People”, in response to the American Recovery and Reinvestment Act of 2009, limited competition: NIH Challenge Grants in Health and Science Research (RC1) (RFA-OD-09-003)15-RR-101 “Applied Translational Technology Development”.

De Witt, JK, **Ploutz-Snyder L**, Scott-Pandorf M, Everett M, Williams M, Newby N: “Biomechanical Analysis of Treadmill Locomotion on ISS”, to NASA for consideration as a directed study.

**Huff JL**, Rustgi AK, **Patel ZS**, invited to submit Step-2 proposal for “Impact of Radiation Quality on Cancer Development Processes Studied in a 3-D Human Esophageal Cell Model System”, in response to NNJ09ZSA001N: Ground-Based Studies in Radiobiology.

## What’s Going On With ....

**Jancy McPhee** is assisting the SLSD Innovation/Venture Capital/ Entrepreneur Team with the preparation of materials for the Rice Live Case analysis, and interviewed Dr. Davis on the history of strategic planning for this event. She developed a strategy for collecting information, and will also create plans to improve follow-up with the companies selected during the Rice Alliance Competition. Jancy further agreed to lead the development of a “NASA Categories of Evidence” system to be vetted through SLSD and used in HRP and HSRB.



*Jancy McPhee, PhD*

**Larry Kuznetz** is drafting an agreement between ARC, GRC, JSC, and the US Naval Academy to plan and

implement the next phase testing of the bioastronautics advisory algorithm and the Mobile Agent Voice Recognition System.

**Megumi Hada** discussed a possible collaboration with Drs. A. Takahashi and T. Ohnishi from the Nara Medical University, Japan, to analyze chromosome aberrations in Japanese ISS samples.

**Rob Ploutz-Snyder** is heavily involved in statistical consulting, experimental design formulation, proposal and technical manuscript writing of statistical methods and experimental results, including the toe-clearance/gait study, the injury risk model development for the Orion crash protection project, modeling of metabolic cost for various proposed spacesuit designs, and writing the experimental design and statistical analysis section for the proposal for the finger-injury flight experiment.

## Inventions!

Byerly D, Arndt D, **Sognier MA**, Disclosure of invention for “Noninvasive Treatment of Dental Caries Using Focused Microwave Energy” is in final editing.

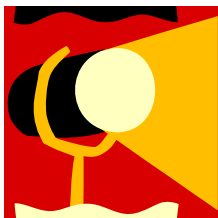
Byerly D, Arndt D, **Sognier MA**, Disclosure of invention for “Noninvasive Treatment of Diseased Pulpal Tissue Using Focused Microwave Energy” is in final editing.



**James Fiedler** has assisted in the preparation of a manuscript on assessing the sensitivity of two cognitive tests to drug-induced sleepiness by means of a Bayesian analysis involving a latent sleep variable. James has also completed an extensive Bayesian analysis of the recovery trend and distribution of sensory organization posture scores after short-term spaceflight, and is currently developing the methodology and software program for implementing multivariate non-parametric regression based on Kendall’s Tau, to assess the relationship between lens opacity and exposure to space radiation for the NASA Cataract Study.



*James Fiedler, PhD*



## SPOTLIGHT ON: Johnny Conkin, PhD!

*Johnny Conkin, PhD, a Senior Scientist in the Environmental Physiology Laboratory, was recently interviewed for the Spotlight Article.*



*Johnny Conkin, PhD*

Dr. Johnny Conkin has actively participated in NASA research for more than 28 years. In 1979, he joined the Environmental Physiology Laboratory at JSC. He earned his Master's degree in Biology from the University of Houston Clear Lake in 1982, and his Doctorate in Physiology from the State University of New York at Buffalo in 1993. His dissertation work focused on probabilistic modeling of aviator decompression sickness. Dr. Conkin has authored or co-authored 23 peer-reviewed publications and 38 contractor reports.

*\* Tell us briefly about yourself and your family.*

My wife (Claudia) and I met at JSC, both transplants from the north during the southern migration for jobs in the late 70's. She works very hard at Texas Children's Hospital. Our two daughters, Jennifer (25) and Megan

(22) are pure-old Texans, and proud of it. Jennifer is currently looking for work as a high school teacher, and Megan is in her last year in Computer Graphics Design at the University of Houston. My entire family, including Megan's cat and Jenny's dog are female, so I lose every decision that comes to a vote.

*\* What are you presently working on at JSC?*

The Moon exploration program has a lot of front-end work that needs to get done before the first foot once again touches the lunar surface. This is a great time to be part of the space program since the new problems and most of the new solutions are being worked now. I am involved in defining denitrogenation procedures that will avoid decompression sickness in astronauts during unplanned decompressions in



*Mission Specialist Mike Massimino during an STS-125 EVA. Photo courtesy of NASA.*

the Orion and Altair vehicles, and planned decompressions during EVAs from the Altair and the future Moon habitat. My colleagues and I are working to understand the precise physiological and medical consequences of living and working in the reduced atmospheric pressures in our future space vehicles. Much needed analysis and discussion with experts is underway.

*\* What is really important to you regarding your work at JSC?*

Nothing is impossible as long as there are good communications and resources to match a particular problem. It's important to me that real problems are identified well in advance, that problems are understood, then acted on through proper communication and allocation of resources. It's important to me that research and testing paves the way for operations, and that "Go Fever" never outpaces the research that needs to be done to maximize astronaut health and productivity.

*\* What are your goals for this year?*

I continue to support operational plans for EVAs from the shuttle and ISS. I continue to support our research efforts to provide a new in-suit exercise pre-breathe protocol, to understand more about tissue micronuclei that are the precursors of bubbles responsible for decompression sickness, and to understand in greater detail the risk of acute mountain sickness associated with mild hypoxia exposure. It's only through an understanding of the problem that you can then develop effective risk mitigation strategies.

*Thank you so much for being our Spotlight Scientist for this edition of the DSLS newsletter, Johnny!*



*Hyperbaric Chamber Photo Courtesy of NASA*

## 6th Annual NASA Space Radiation Summer School

16 graduate students, post-doctoral fellows, and working scientists plus four auditing professionals, including Dr. **Artem Ponomarev**, travelled to New York in May to participate in this year's Space Radiation Summer School at Brookhaven National Laboratory. During the intensive three week course, designed to educate and nurture the next generation of researchers, students participated in both classroom studies and scientific experiments. The summer school is sponsored by NASA and managed by Brookhaven Lab, Loma Linda University Medical Center, and USRA. DSLS' own **Kellie Rogers** successfully coordinated all travel arrangements for students and faculty, procured and accepted course presentations, traveled to Brookhaven Lab, and spent one week onsite to facilitate coordination for students and faculty, and to interface with transportation, housing, printing, and catering vendors. Congratulations on another successful Summer School!



*Kellie Rogers*

## New Publications by DSLS Scientists

**Plante I** & Cucinotta FA. 2009. Cross sections for the interactions of 1 eV–100 MeV electrons in liquid water and application to Monte-Carlo simulation of HZE radiation tracks. *New J. Phys.* 11. <http://stacks.iop.org/1367-2630/11/063047>

Ding HL, **Ryder JW**, Stull JT, Kamm KE. 2009. Signaling processes for initiating smooth muscle contraction upon neural stimulation. *J Biol Chem*, online ahead of print April 6. <http://dx.doi.org/10.1074/jbc.M900888200>

**Wood SJ**, Black FO, Reschke MF, Kaufman GD, Paloski W. 2009. Effects of eccentric rotation on the human pitch vestibule-ocular reflex. *Acta Oto-Laryngologica*, 129:521-526. <http://dx.doi.org/10.1080/000164808022373090>

Byerly D & **Sognier MA**. 2009. Isolation of precursor cells from waste fat tissue. NASA Tech Briefs MSC-23775-1. <http://www.techbriefs.com/>

[component/content/article/5231](http://component/content/article/5231)

Izquierdo R, Morin P, Bratt K, Moreau Z, Meyer S, **Ploutz-Snyder R**, Wade M, Weinstock RS. 2009. School-Centered Telemedicine for Children with Type 1 Diabetes Mellitus. *J of Pediatrics*, e-pub ahead of print. [http://www.jpeds.com/article/S0022-3476\(09\)00243-0/fulltext](http://www.jpeds.com/article/S0022-3476(09)00243-0/fulltext)

Piriou E, Khimmel R, Chelimo K, Middeldorp J, Odada P, **Ploutz-Snyder RJ**, Moormann A, Rochford R. 2009. Serologic Evidence for Long-Term EBV Reactivation in Children Living in a Holoendemic Malaria Region of Kenya. *J of Medical Virology*; 81(6): 1088-93. <http://dx.doi.org/10.1002/jmv.21485>

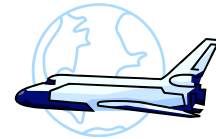
**Accepted for Publication:**

**Kim M-HY**, Hayat MJ, Feiveson AH, Cucinotta FA. Prediction of Frequency and Exposure Level of Solar Particle Events. *Health Physics Journal* 97(1). In press.

Paloski WH, Oman CM, Bloomberg JJ, Reschke MF, **Wood SJ**, Harm DL, Peters BT, **Mulavara AP**, Locke JP, Stone LS. Risk of Sensory-Motor Performance Failures Affecting Vehicle Control During Space Missions: A Review of the Evidence. *J of Gravitational Physiology*. In Press.

Cowley, PM, **Ploutz-Snyder LL**, Baynard T, Heffernan K, Jae SY, Hsu S, Lee M, Pitetti KH, Reiman MP, Fernhall B. Physical Fitness Predicts Functional Tasks in Individuals with Down Syndrome. *Medicine and Science in Sports and Exercise*, accepted 2009.

**Zhou D** & O'Sullivan D. Methods Using CR-39 Plastic Nuclear Track Detectors in Radiation Research. Chapter for the book *Nuclear Track Detectors: Design, Methods, and Applications*. Nova Science Publishers.



## Education and Public Outreach

**Lori Ploutz-Snyder** worked with Baylor intern Liz Redd to prepare her exit presentation, graded her internship, and reported to Baylor. She held a thesis defense via telecom for Syracuse University Master's student Andrew Kelleher and mentored Syracuse graduate student Summer Cook and UH graduate student Meghan Everett. In addition, she met with NASA educators for the "Fit Explorer" program targeted at upper elementary students. Lori also presented a talk on exercise physiology to HISD students as part of the Saturday Morning Science Community Outreach Group, and met with Courtney Barringer to plan lectures for her Space Physiology course this summer.

**Rob Ploutz-Snyder** mentored Roxanne Nash, a student in the UH Physical Education Master's program, who is working on a study examining ef-

fects of visual feedback and time between repeated observations of leg extension force. He also delivered four lectures "What every exercise physiologist should know about biostatistics" to members of the Exercise Physiology and Countermeasures Lab.



Scott Wood, PhD

**Scott Wood** mentored USRA College Career Exploration Program intern Krystin Ramos and assisted T. Makishma, MD PhD, UTMB Otolaryngology, with the preparation of an NIH training grant.

**Johnny Conkin** mentored Ms. Prabhakar, a 4th year medical student participating in the NASA Aerospace Medicine Clerkship program, who evaluated literature on mild hypoxia

and adaptations to microgravity. Johnny also led a tour of the Bldg. 32 chamber facilities for the Aerospace Medicine clerks.

**Roni Cromwell** mentored NSBRI summer intern Cheryl Goetz and judged the 12th grade division at the International Regional Science Fair of the Association of Christian Schools.

Roni discussed the Flight Analogs Project with Cox Radio interviewer Mike Mollet, was interviewed by Helen Anders of the *Austin American Statesman*, and led a tour of the Flight Analogs Research Unit for the Clinical Translational Science Awards site visit by the NIH/National Center for Research Resources.



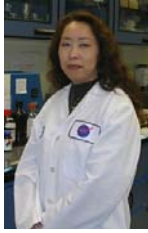
Roni Cromwell, PhD

(Cont. on Page 6)

## Recent Scientific Presentations

George KA, **Hada M**, **Patel Z**, **Huff J**, Pluth JM, Cucinotta FA.

“DNA repair defects and chromosomal aberrations: Comparisons after low and high dose irradiation”. DOE Low Dose Radiation Research Investigators’ Workshop VIII, Bethesda, Maryland.



*Megumi Hada, PhD*

Radiation Biophysics Group Seminar.

**Hada M**: “DNA repair defects and chromosomal aberrations”.



*Myung Kim, PhD*

Radiation Biophysics Group Seminar. **Kim M-HY**: “Graphical user interface in development for ARBOD (Acute Radiation Risk and BRYNTRN Organ Dose Projection)”.

Radiation Biophysics Group Seminar.

**Plante I**: “Simulation of TGF $\beta$  activation by low-dose HZE radiation in a cell culture”.

Radiation Biophysics Group Seminar. **Ponomarev A**: “Energy deposition and foci formation”.



*Artem Ponomarev, PhD*

Franklin RM, Goulopoulou S, Baynard T, Weinstock RS, Carhart, JR R, **Ploutz-Snyder R**, Fernhall B, Kanaley JA: “The effects of exercise training on autonomic function in subjects with low and high parasympathetic modulation”. Abstract/poster at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, Washington.

**Wallace WT** & Cooper B: “Grinding for particle size reduction”. Oral talk at the LADTAG Science Review Meeting, Nassau Bay, Texas.

**Wallace WT**, Hammond D, Cooper B, Garrison D, Hay-Bailey E, Liceaga C, Intiaz R, Jeevarajan AS, Konovalova

T, Kisper L, Taylor LA, Liu Y: “Lunar dust and lunar simulation activation and cellular toxicity properties”. Oral talk at the LADTAG Science Review Meeting, Nassau Bay, Texas.



*Billy Wallace, PhD*

**Wallace WT**: “Luna: What did we learn and what should we expect?” Oral talk at the Student Research Forum, UTMB, Galveston, Texas.



*Photo Courtesy of NASA*

DSLS Brown Bag Seminar. **Zanello S**: “Tissue Analogues and Disease Modeling Laboratory: Capabilities for tissue modeling, simulated environments, and gene expression profiling”. USRA Houston.

**Ploutz-Snyder L**: “Skeletal Muscle Atrophy, Exercise Countermeasures and Long-Duration Spaceflight: Implications for Oxidative Damage”. Oral talk at the NIH, National Cancer Institute, Washington, DC.

Hackney KJ, Kelleher AR, **Ploutz-Snyder LL**: “The effect of consecutive bouts of resistance training on resting energy expenditure”. Abstract/poster at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, WA.

Loehr JA, Lee SMC, Feiveson AH, **Ploutz-Snyder LL**: “Reliability of maximal strength testing in novice weightlifters”. Abstract/poster at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, WA.

**Ploutz-Snyder LL**: “Efficacy of blood flow restricted exercise”. Symposium at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, WA.

**Ploutz-Snyder LL** & Cook SB: “Low load resistance training with blood flow restriction as a countermeasure to disuse atrophy”. Abstract/poster at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, WA.



*Lori Ploutz-Snyder, PhD*

**Ploutz-Snyder LL**: “Neuromuscular adaptations to prolonged disuse”. Invited talk for the Department of Physical Therapy, University of Texas Medical Branch.



*Ajit Mulavara, PhD*

Spiering BA, Lee SMC, **Mulavara AP**, Bentley JR, Nash RE, Sinka J, Bloomberg JJ:

“Using maximal isometric force to determine the optimal load for measuring dynamic muscle power”. Abstract/poster at the 56th Annual Meeting of the American College of Sports Medicine, Seattle, Washington.

**Quan C**, Lam C-W, James J: “Benchmark dose comparison of lunar dusts to reference dusts”. Oral talk at the LADTAG Science Review Meeting, Nassau Bay, Texas.



*Chunli Quan, PhD*



## Education and Public Outreach *(cont. from Page 4)*

**Dazhuang Zhou** reviewed a manuscript for *Advances in Space Research*.



Dazhuang Zhou, PhD

**Sara Zwart** mentored UTMB student Cheryl Hart and participated in a tele-interview with a middle school in Lake Alfred, FL, for their “NASA No Boundaries” program. She presented “Nutritional Biochemistry of Spaceflight” for librarians and after school providers in North Carolina and in Memphis, Tennessee via the web, and at the Baylor College of Medicine Saturday Morning Science for middle and high school students. Sara also reviewed a manuscript for *Food Research International*.



Jean Sibonga, PhD

**Jean Sibonga** read and commented on a proposal for an oral qualifying exam for UH Clear Lake biochemistry doctoral student Marc Charendorff. She presented a talk on career decisions to students from the Incarnate Word Academy at

Space Center Houston, and reviewed manuscripts for the *Journal of Bone and Mineral Research*, the *Journal of Applied Physiology*, and *Bone*. Jean led tours of the functional task testing and countermeasures for sensorimotor adaptation for Dr. Ron Midura and reviewed the final fracture and osteoporosis risk presentations for the Hyman System Risk Board based on Dr. Midura’s and others’ input.

**Jason Boyd** reviewed a manuscript for the *Journal of Clinical Pharmacology*.

**Larry Kuznetz** mentored USNA intern Jason Memoring, who developed a code for indexing EVA terrain and task effort to measure actual EVA progress vs. pre-mission predictions.



Larry Kuznetz, PhD

**Billy Wallace** mentored intern Rasheen Imtiaz and led a facility tour for Prof. Ah-Kay Ng from the University of Southern Maine.

**Patrice Yarbough** continued her work with the Association of Women

in Science President and the NSF Advance Director to develop and improve the representation of minority women in the STEM pipeline.



Patrice Yarbough, PhD

**Marguerite Sognier** presented awards to students at the Ball High School Pathfinders Health Careers Academy.



Susi Zanello, PhD

In celebration of the International Year of Astronomy, **Susi Zanello** followed the events of the STS-125 Hubble Repair Mission with 8th grade students at Escuela de Ciclo Basico in Bahia Blanca, Argentina, and answered their questions via email.

**Chris Westby** reviewed a manuscript for the *Journal of Applied Physiology*.

**Jeff Ryder** reviewed a manuscript for the *American Journal of Physiology / Endocrinology and Metabolism*.



Jeff Ryder, PhD

## Mark Your Calendar!

### DSLS Brown Bag Luncheon Seminar:

July 23, 2009

11:30 a.m. - 12:30 p.m.

Berkner Room

“NASA SBIR STTR Programs and Some Technology Innovations”

**Kumar Krishen, PhD**

Lead Technologist /

ST Senior Scientist

Technology Transfer Office

NASA JSC

### DSLS Seminar Series:

July 28, 2009

10:30 a.m. - 11:30 a.m.

Hess Room

“Changes in postural muscle properties and bone mineral density following removal of vestibular afferents in rats”

**Pierre Denise, MD PhD**

Neurologist, Faculté de Médecine

Caen, France

### Aerospace Medicine Grand Rounds:

July 28, 2009

8:00 a.m. - 9:00 a.m.

Lecture Hall

“Potential Transformational Mission Health and Performance Benefits of Cell Stress Response Upregulation”

**David B. Gillis, MD PhD MPH**

Advanced Projects, Space Medicine Group, Wyle Integrated Science and Engineering/NASA JSC

**Susana B. Zanello, PhD**

Disease Modeling/Tissue Analogues Laboratory, USRA Division of Space Life Sciences/NASA JSC

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Dagmar Morgan—Editor

Division of Space Life Sciences  
Universities Space Research Association  
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DSLS Newsletter

UNIVERSITIES SPACE RESEARCH ASSOCIATION

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# Survey—Professional Development—Your Input is Needed!

Please take a moment to print just this page, complete the professional development survey below, and return it to Dagmar (hard copy or scan and email will work). Thanks!!

How would you rate your interest in a **Time Management Class**?

- Low
- Medium
- High

Would you be interested in a **Stress Management Class**?

- No—I feel just fine.
- Maybe ...
- Absolutely!

Would you be interested in learning **Microsoft Project**?

- No, thanks.
- Maybe....
- I'm very interested.

Are you interested in a course on how to **write a better paper**?

- Nope.
- Maybe that would be helpful....
- I need all the writing help I can get.

Would you be interested in **Statistics** lectures or a workshop? If so, at what level?

- No
- Yes—general high-level overview lecture.
- Yes— workshop on specific topic. Please note topic(s) below:

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Name: \_\_\_\_\_

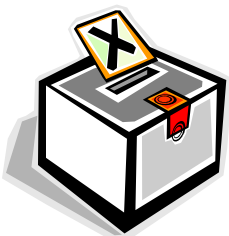
Email: \_\_\_\_\_

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**Comments:**

Please note any other topics of interest here.

Also, please note if you would be willing to teach any of these or other courses!



*Thank you for your input!*

*It will assist us in planning and providing the Professional Development Courses that are of particular interest and benefit to you.*

*Dagmar*