

Georgia Tech Award for Academic Outreach Nomination

Professor Ellery Ingall

School of Earth and Atmospheric Sciences

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January 28, 2015

CETL Faculty Outreach Award

Dear Awards Committee,

I enthusiastically nominate Dr. Ellery Ingall for the CETL Faculty Outreach Award. Dr. Ingall is one of the leaders in Earth Science education for middle school teachers in the Atlanta metro area. In the past decade he has trained more than 80 teachers in a series of intensive programs (with a total of more than 900 contact hours) during both the summer and academic year. I personally know that Dr. Ingall takes great pride in the quality of his training programs. He makes it a priority to both engage and excite the teachers as well as to provide them useful materials. Prof. Ingall has organized an ever evolving series of field trips to give teachers hands on real world experience. In addition, each teacher is provided with ready-made lesson plans as well as rock and mineral kits. I know that teachers are very appreciative of these programs due to the passion and energy that Dr. Ingall brings to this work. I know that I am appreciative of this work as a parent with children in metro Atlanta public schools.

In all honesty, I have never been more certain that an individual is deserving of an award than in this case. Dr. Ingall has a tremendous and direct impact on K-12 education and is engaged in activities that are essential to public education. The School of Earth and Atmospheric Sciences is extremely proud of his work and wholeheartedly supports his nomination. Please contact me if I can be of any additional help.

Sincerely,

A handwritten signature in black ink that reads "L. Gregory Huey".

L. Gregory Huey
Professor and Chair
School of Earth and Atmospheric Sciences
Georgia Institute of Technology

Description of Outreach Activities - Ellery Ingall

I have been organizing and teaching intensive short courses to middle and high school teachers from the Atlanta region since 2005. The goal of these courses is to provide an intensive (but also fun!) professional learning experience to improve Earth Science education in Georgia Schools. Hands on exercises, field trips and lesson plan development, are key components of these courses. So far, I have spent 900 contact hours working with approximately 85 teachers over the last several years (Table 1).

Table 1. Summary of outreach courses

Year	Contact Hours	Teachers	Teacher Counties	Notes
2005	120	14	Fulton, DeKalb	4 week - Summer Workshop
2008	180	16	Fulton, Cobb, Bartow, Rockdale, Dekalb	Two 2 week Summer Workshop + 8 sessions during school years
2008-2009	80	14	DeKalb, Fulton	2 week Summer Workshop + 2 follow up sessions during school year
2010-2011	120	10	Fulton	Two 2 week Summer Workshops
2011-2012	200	22	DeKalb	Two 2 week Summer Workshops + 10 sessions during school years
2013-2014	200	22	Newton	Two 2 week Summer Workshops + 10 sessions during school years
2015-2016	200*	9	Clayton	Two 2 week Summer Workshops + 10 sessions during school years
Total	900	85		

*Just initiated and ongoing

Overview: During a typical workshop classroom/laboratory day we have morning discussions on a wide variety of earth science topics (see Table 2, for examples) followed by discussions led by a highly experienced K-12 teacher covering the details of standard implementation and effective teaching tips. In the afternoon, laboratory exercises reinforce the topics covered in morning discussions. In addition, to the classroom and laboratory activities several field trips are taken to expose the teachers to local earth science teaching resources and to generally widen their appreciation for earth science. Additionally, these trips provided opportunities for teachers to collect rock and fossil specimens to use as classroom materials. A key goal of the class was to provide the teachers with a wide array of teaching materials to take back to their schools. In addition to the materials collected on the field trips, teachers assembled large collections of minerals, rocks and fossils in the lab. I estimate that at least 4000 individual rock, mineral and fossil specimens have been given to teachers as part of these workshops. Teachers were also given

copies of mapping software, books and equipment useful for teaching earth science. These materials can be used for many years thus providing a long-term benefit to K-12 education.

A key concern of school system administrators is that the content of these workshops directly covers Georgia Performance Standards (GPS). These standards are the basis for the all-important standardized tests given to middle school students. Care was taken to make sure all topics covered addressed one or more of these standards (Table 2).

Field Trips: Geology is a subject that is best appreciated in the field, as such; a number of field sites are visited during a typical workshop. Below is a list of some of the sites visited during these workshops over the last several years. A short video of teachers at some of the following sites can be viewed at: http://shadow.eas.gatech.edu/~ingall/Ellery_Ingalls_Site/Outreach.html

- Tellus Museum
- Vulcan Materials Quarry (See Figure 1)
- Arabia Mountain
- Stone Mountain
- Panola Mountain USGS water monitoring site
- Local Atlanta Sites including the 16th Street Parking Deck, Tanyard Creek
- Fernbank Science Center Planetarium
- Fernbank Museum
- Raccoon Mountain Caverns
- Ringgold and Trenton Georgia Fossil collecting/sedimentary rock sites
- Cloudland Canyon and nearby fossil site
- Elberton Georgia – Quarry museum and visit to working quarry
- Lake Lanier – Floating Classroom, Drinking water treatment facility
- Gwinnett Environmental and Heritage Center, sewage treatment facility
- Charlie Elliott Wildlife Center
- Conasauga River Trilobite Site
- Barite Mine near Cartersville GA (See Figure 1)
- Sandersville Kaolin Mines
- Hamburg Mill State Park
- Elachee Nature Science Center

Project Support: Logistical support for these workshops has been provided through CEISMC at Georgia Tech. Funding for materials and activities has been obtained through the “Leave No Child Behind” and “Race to the Top” grant programs. Meg Grantham, a research scientist, in Earth and Atmospheric Sciences, has also provided content and logistical support.

Program Impacts: The recent workshop given in Newton County was professionally evaluated. Comparing the Life, Physical and Earth Science groups in parallel workshops. The Earth Science group showed the greatest improvements in standardized test scores. For other past workshops, I often hear from teachers that their students are very impressed and amazed that they personally collected some of the neat fossil and rock samples used in class. At the end of the class teachers present complete lesson plans covering different elements of an earth science teaching standard. These ready to use lesson plans are collected and distributed electronically to the teachers.

Additionally all other class materials including PowerPoint presentations, lab exercise documents, mini quizzes, videos and photographs are distributed to the teachers.

Figure 1. Field trip to Barite mine (top), Vulcan materials quarry (bottom)



Table 2: Typical workshop activities

Day	Topic	GPS Standards
1	Introduction, Pretest, Teaching Pedagogy, Earth Materials Concepts: Scientific view of earth surface formation Exercises: Pretest, Pedagogy Instruction, Mineral Identification	S6E5ab
2	Earth Materials, Plate Tectonics Concepts: Scientific view of earth surface formation Exercises: Rock Identification, Geoworld Plate Tectonic Exercise	S6E5bcdef
3	Maps, Geology of Georgia, Fossils Concepts: Scientific view of earth surface formation Exercises: Computer based map exercises (National Atlas, GeoMapApp), Fossil identification & observation	S6E6b, S6E5deghi
4	Tellus Museum + Barite Mine 8am-5pm Concepts: Geology of Georgia, Earth Materials, Natural Resources, Weathering, Erosion, Astronomy	S6E1b, S6E5abcdefgh, S6E6b
5	Understanding the Universe Concepts: Scientific view of the universe, relative position of different celestial bodies Exercises: Wavelength/Spectroscope Lab, flame spectroscopy, Fluorescent materials	S6E1abcdef
6	Positions and Movements of Celestial Bodies Concepts: Moon phases, seasons, solar and lunar eclipses, waves & tides Exercises: Moon phase demonstration, Understanding seasons, tides	S6E2abcd
7	Water in Earth Processes, Oceans Concepts: Distribution of water on earth, water cycle, density, rivers, oceans Exercises: Water density exercise, Water distribution exercise, benthic boxes of mystery exercise	S6E3abc
8	Floating Classroom Lake Lanier + Gwinnett water treatment facility Concepts: Hydrology, rivers, energy, role of water in earth processes	S6E3abc, S6E6b
9	Post Test, Lesson Plan preparation, Teacher's choice topic Exercises: Post test, Lesson plan preparation	
10	Lesson Plan Presentations Teachers will present complete lesson plans on an Earth Science topic. Plans will be collected and made available to all participants.	
11	Radiometric Dating and Relative Geologic Time Concepts: Relative vs. Absolute Ages, Geologic Time Scale, Logic Exercises: Event diagrams, online radiometric dating	S6E5deg
12	Field Trip - Sandersville Kaolin mines & Hamburg Mill State Park Concepts: Geology of Georgia, Earth Materials, Natural Resources, Weathering, Erosion	S6E5bcdghi, S6E6b
13	Field Trip - Arabia Mountain Concepts: Geology of Georgia, Earth Materials, Natural Resources, Weathering, Erosion	S6E5bcdghi, S6E6b
14	Field Trip - Northwest Georgia, Southeast Tennessee Concepts: Geology of Georgia, Earth Materials, Natural Resources, Weathering, Erosion, Fossils Activities: Fossil and Rock collection, Cave tour	S6E5bcdfghi, S6E6b
15	Weather Concepts: Effect of land distribution on climate and weather, El Nino, La Nina, Temperature, Pressure, Humidity, Fronts, Air Masses Exercises: Pressure - Build your own barometer, Humidity Wet vs Dry bulb thermometer, Weather Map Interpretation	S6E4abc

28 January 2015

Dr. Paul Wine
Award Committee Chair
School of Earth and Atmospheric Sciences
Georgia Institute of Technology
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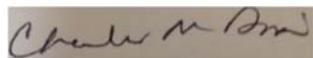
Dear Dr. Wine,

Thank you so much for contacting me about nominating Dr. Ellery Ingall for the Georgia Tech outreach award. I enthusiastically support his nomination. I first met Ellery in 2011 when we started working together with a group of DeKalb county middle school teachers on Earth Science education. Over the next two years, Ellery and I worked together with a group of about 20 teachers. He would present Earth Science content and lead numerous hands on lab activities and field trips. I worked with the teachers to translate this scientific content into activities for their middle school classes. It was a great experience to work together with Ellery on this project. He easily got the teachers excited about Earth science because it was clearly a subject that he enjoyed himself.

A key part of the program was turning the scientific content into ready to use lessons for middle school students. As a small part of one of these plans, one teacher rewrote the words to the song "We will rock you" so it was actually about rocks. This teacher had the whole class singing and pounding the tables to the beat. It was fun to watch Ellery's delighted reaction to this. This is just a small reflection of the positive and fun learning environment of the class. These ready to use lesson plans, were a great resource for both the workshop participants and me. Among the many activities, the field trips were a highlight. The experiences gained by seeing the geology of Georgia firsthand helped me to better engage my student's interest in Earth Science. Additionally, the trips were a great opportunity to collect samples and photographs to use in our classes. I know Ellery worked very hard and very diplomatically with the DeKalb school administration to convince them of the value of such trips.

When Ellery visited my classroom, he brought buckets full of interesting rocks, minerals and fossils for the kids to enjoy. I think he was impressed by the great enthusiasm and questions of the children. Because of his enthusiasm for student/teacher achievement, I have asked him to become a part of the development team for a new Charter School in DeKalb County.

Sincerely,



Charlisa Dixon
Augustine Preparatory Academy
Science Teacher 2009-2013
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Dr. Keith A. Jones
Principal

Interim Superintendent



Mr. Michael Thurmond
Superintendent

Interim Superintendent

COLUMBIA MIDDLE SCHOOL

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January 29, 2015

Dear Awards Committee,

I am very pleased to recommend Dr. Ellery Ingall for the Georgia Tech Faculty Award for Academic outreach. I was a participant in a two-year teacher workshop on Earth Science taught by Ellery and his colleagues. His enthusiasm for the subject is inspiring and I was able to immediately incorporate the material he presented into my classes. The field trips were obviously thoroughly and carefully planned because we the teachers became the students as we ventured into various science field experiences which was aligned with our Georgia Performance Standard Curriculum.

The mix of lectures, lab activities and teacher lesson plan preparation during the workshops was especially effective for not only improving our basic knowledge in Earth Science but also for providing materials which made us classroom ready upon returning to school. Ellery worked to make the workshop environment relaxed open and friendly. It was clear that he really enjoyed answering the numerous questions posed by the group.

After the workshop, I contacted Ellery about working in his lab during the summer of 2013 as part of the Georgia Intern Fellowship for Teachers (GIFT) program. In addition to helping with the scientific research in the lab, I compiled electronic files and a big notebook full of exercises aimed at middle school Earth Sciences. Ellery was able to use these materials as part of his Newton county teacher workshops. In conversations with Ellery I found out that the overall results for Earth Science the Newton county teacher-training program were excellent. In the Newton program, three areas of science were covered, Earth Life and Physical. The teachers in this program were given MOSART tests of their knowledge of these three areas at the beginning of the class, at the mid-point last year and at the end of the class. Test results indicated that the teachers had the greatest improvements in Earth Science. Based on these results, Ellery and I were awarded the Paul A Duke, GIFT action plan achievement mentor award.

With his boundless enthusiasm for both Earth Science and working with teachers to improve Earth Science education in Georgia, I cannot imagine you can find a better candidate for this award at Georgia Tech.

Educationally,

A handwritten signature in cursive script that reads "Jurita Mays".

Jurita Mays, Specialist Degree
Earth Science Educator

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January 30, 2015

Dear Selection Committee,

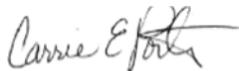
It is a pleasure to write a letter in support of the nomination of Dr. Ellery Ingall for the Georgia Tech Faculty Award for Outreach. I first met Ellery in 2010 when we started working together with a group of Fulton County middle school teachers on Earth Science education. Over the next two years, Ellery and I worked as team to deliver both content instruction and hands-on experiences in the hopes of increasing student achievement in schools struggling to move their students' science knowledge. While Ellery presented Earth science content and led hands-on activities, I worked with the teachers to tailor this content for their middle school classes. It was great to work with Ellery on this project. It was clear that these outreach activities were more than just a job, but something that Ellery enjoyed doing. His spirit was contagious energizing the teachers.

Ellery was often able to provide the teachers with materials to take back and use with their classes, including maps, rock samples, fossils, construction paper etc. These materials were not only great tools for helping the teachers learn, but many of the teachers were also able to use the materials and exercises in their classes right away. The field trips were a highlight for the teachers. They were able to learn about the geology of Georgia and surrounding states by seeing it first-hand. For one trip, he was able to take the group on an overnight trip to Northwestern Georgia. Here, he took us to his favorite fossil collecting sites to fill buckets with fossils the teachers could use in their classrooms. In addition to the rock hunting, the time in the vans and the group meals were a great opportunity for the teachers to swap classroom stories and experiences. Given the busy schedules of teachers during the year, having an opportunity to communicate with colleagues was a real treat. I am still using the many rock and fossil samples collected on these trips in my classroom. My students love that I personally collected the samples.

An important part of this workshop was packaging the scientific content into specific lesson plans that would both appeal to middle schools and meet Georgia educational standards. Hopefully you can get Ellery to show you the video of the Plate Tectonics Rap with associated dance moves developed by one of the teachers. I know he put together a short video showing many of our workshop activities that I believe is available on his website.

I am honored to be able to recommend Ellery for this award and hope that he will be able to inspire teachers and students for years to come.

Sincerely,



Carrie Porter
Assistant Principal
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