Interactive app makes teaching music theory possible online

By Dusty Rhodes
Arts and Humanities Editor

U
niversity professor Heinrich Taube has developed a computer application that could change the way music theory is taught. Called Harmonia, the program allows teachers to create an endless variety of written analysis or analysis assignments, provides students with immediate feedback, and performs instant harmonic analysis of complex compositions. It is the first app created at the U. of I. to appear in Apple’s iTunes store for computer applications, and it could pave the way for teaching music theory online.

Taube, a composer who has also designed software for music composition, began working on a music theory program in 1996, soon after he arrived at Illinois and realized that teachers were still relying on chalkboards, paper and pencils.

“It was like some time machine,” Taube said. “I had been working in the field of computer music production, where every year something new would come out. I stepped back into the classroom, and people were teaching theory the same way they did a hundred years ago.

At most colleges, music majors spend their first two years learning theory—the formulas for building scales and chords, the complicated rules for moving from one sonority to the next, the laws of physics and the musical conventions that have formed the building blocks of Western musical compositions for centuries. These lessons are traditionally taught in part by deconstructing existing compositions, such as Bach chorales—widely considered the canonical rite of harmonic and voice-leading. From there, students move on to writing their own harmonies on worksheets, penciling in notes over the sketch of a bass line or a string of Roman numerals indicating the types of chords to be built. However, such assignments can have many correct answers, so grading the results can be tedious and time-consuming.

Taube’s Harmonia application allows teachers to create assignments in music, text, images and videos; students can complete them online. The program can play the resulting harmonies so that the student can hear the notes, and then grade the result or simply provide helpful feedback, instantaneously.

“This is so much better than paper,” Taube said. “It’s the only way that music theory can participate in massive open online courses. If a university wants to have an online academy for music theory, you need something like this. Otherwise, it’s just a bunch of videos.”

At the heart of Harmonia is a computer program Taube wrote more than a decade ago (his article “Automatic Tonal Analysis: Toward the Implementation of a Music Theory Workbench,” was published in Computer Music Journal in 1999). He created algorithms that detect and identify normative harmonic behaviors (triads, sevenths, inversions, cadences) and use a hierarchical scanning method, searching first for easily identifiable sonorities, making another pass to examine passing tones, then computing a complete functional and harmonic analysis of the composition, including detection of stylistic anomalies. This method is blazingly efficient; Taube’s Music Theory Workbench can deconstruct Bach’s dense, complex chorales at a rate of 19 chorales per second.

Harmonia can do much more than that. Besides chorales, Harmonia can analyze piano music and orchestral scores. It can generate and grade theory lessons using sonorities, Roman numerals or figured bass (chord progressions indicated by letter names, scale positions or inversions) and even discourage students from copy- ing each other’s work, thanks to a randomizer that changes assignments to a different key signature for each student. Teachers can add music, text, images and videos; Harmonia can edit music notation and multimedia.

Taube writes programs and computer languages, but said that his collaborator, William Andrew Burnson, “is responsible for more of Harmonia’s coolness than I am.” Burnson came to Illinois in 2007 to pursue a master’s degree in music composition, and began working with Taube as a teaching assistant, huge MUSIC APP, Page 2

ON THE WEB
go.illinois.edu/FDO
Click “database” service being offered widely, Weatherford said her office would take campus requests and start the search process. Results of the search were then shared with faculty members. Now, she said, faculty members can take the lead in the process and narrow their search before even getting to the application process.

“After the preliminary search, there can be quite a sizable queue to go through,” she said. “This allows faculty to do the fishing themselves and then come back to us for a more detailed search.”

Just last year, requests for campus foundation funding have gone up by 40 percent, something Weatherford called “a pretty significant increase.”

See ONLINE GRANTS, PAGE 3

ONLINE VIDEO

go.illinois.edu/Harmonia_Video

Malice-free zone

The Alice Campbell Alumni Center, home to the U. of I. Alumni Association on the university’s Urbana campus, recently was given a life-size sculpture of Abraham Lincoln. Created by artist Mark Lundeen, the sculpture was a gift from Chad Kellogg, a 1965 U. of I. graduate and former member of the Alumni Association’s board of directors. Lundeen is seated on a bench holding notes from the last paragraph of his second inaugural address in 1865. Etched in bronze and in his handwriting, the notes read: “With malice toward none; with charity for all.” The bronze and ironwood artwork is at the east entrance of the center and is expected to quickly become another photo backdrop for students, alumni and visitors.

This is the second sculpture on the campus by a member of the Lundeen family. The large bronze statue of Bliss football great Harold “Red” Grange, on the west side of Memorial Stadium, was created by Mark’s brother, George, in 1933 Illinois graduate in art and design.

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Peter D. Constable to be next Veterinary Medicine dean

By Diana Yates

P
der 96, to 300 percent complete, and plans to begin using its

The U. of I. will share the money it receives from a legal settlement between the Big Ten and Pennhsylvania State University with local child abuse prevention programs.

The U. of I. shares of the settlement, received after the University of Illinois Urbana-Champaign and Penn State football coaches Jerry Sandusky and Jerry Tropm, respectively, were convicted of child abuse.

University has surpassed the $400 million mark. The previous high was $367.4 million in 2012.

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U. of I. sets new standards in fundraising marks

The U. of I. has had another record-setting year in fundraising for the fiscal year that ended June 30.

The University of Illinois Foundation established a record for new gifts, grants, pledges and deferred commitments of $428 million for FY13. This is the first time that the university has surpassed the $400 million mark. The previous high was $367.4 million in FY07.

The Urbana campus recorded more than $342 million in new business during FY13. UIC was at the $75 million mark while UI was at $172 million.

The university received 144,820 gifts during FY13 — an increase of 2 percent compared to a year ago.

The goal in the university’s fundraising program is the result of the enthusiastic support of the university’s alumni, friends and other donors, said James Siry, director of development and alumni relations.

“The support we have received from our donors for the college is tremendous. We are grateful for the support of the board of trustees, the president and the provost, and the college,” Siry said.

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“Software designers like Andrew don’t just grow on trees,” Taube said.

United Way is recommending that $10,000 of the fundraising be used for the four entities to work together with United Way to provide a program for the community focusing on education and awareness.

Under the arrangement, the United Way has agreed to waive any grant-management fees and to monitor how the agencies use the money. The United Way then will report those results to the university.

“All of these organizations serve a critical need in our community — protecting children and the money will be used to enhance or expand their services,” said Chancellor Phyllis M. Wise. “The settlement is the result of a tragedy, but the hope is that gifts will serve a positive purpose and change people’s lives.”

Inside Illinois

2013-14 Publication Schedule

FALL 2013

Sept. 5

Dec. 5

SPRING 2014

Jan. 16

May 15

April 3

Aug. 7

June 5

Aug. 21

May 1

SUMMER 2014

June 19

July 3

July 17

March 20

April 17

May 1

For a full listing (in PDF format), view the list compiled for the July UI Board of Trustees meeting.
Commencement 2014 to be held in one ceremony, outdoors on a Saturday

By Mike Helenthal

have been held indoors at what is now State Farm Center (formerly Assembly Hall). This change on the part of the committee was an important decision in part because it is larger and more exciting. Graduates and ceremony participants will be seated on a stage and on the field, while spectators will sit in the bleachers.

Rain is a concern, she said, but commencement will be held outdoors regardless of weather, unless it becomes dangerous. She said that the arena is still being worked out and will be announced on the commencement website, which will be updated soon. There will remain nearly the same, with State Farm Center lots available for the event.

“We’re just going to keep thinking positively and expect great weather,” she said.

Wilhelm-Barr said it’s likely the renovation project also will affect the 2015 graduation activities.

“Requests to add the service go back several years,” he said. “I am glad that cir-

For more summer reading recommendations: go.illinois.edu/SummerReading13

Summer Reading

Celia Mathews Elliott
director of external affairs and special projects, department of physics

In the old lady sitting in Intermencese or a campus restaurant at a late lunch, I can often be found engrossed in a book. Several years ago, I decided for the sake of the few remaining shreds of my sanity that I no longer was going to eat lunch at my desk - I owed it to myself and my health. I am glad that circ-

KEYWORDS

keyword searching — even across all recent IRS 990s.

“Illogic research university should be and do. We are a great university among great uni-

The world whole is moving faster than ever before so we must be agile — and we will move quickly. But, we are going to move strategically and we are going to move with values, our culture and our traditions. With our collective vision coalescing and a clear framework to guide our decisions and investments, we are able to position ourselves now to lead in the way to finding solutions to the grand challenges of this century.

That is the commitment of a pre-eminent public research university with a land-grant mission and a global impact in the 21st century. It is an expecta-

“Anyone on campus can search through any of the data-

Phyllis M. Wise Chancellor

University officials wanted to get the word out about the changes as early as possible, giving parents adequate time to prepare, she said. Several other, smaller-

The new strategic plan also will affect the 2015 graduation activities. The construction work at State Farm Center lots available for the event.

There are up to 54 search fields including federal search all the way up to final reporting.

As soon as I finish one book, I start another. Until I have read all the new books, I won’t even close.

University officials wanted to get the word out about the changes as early as possible, giving parents adequate time to prepare, she said. Several other, smaller-scale graduation-related events, such as unit ceremonies, will also be moved to allow for the construction work.

“If it’s a big shift and we want everyone to have all of this information, they need to make plans,” Wilhelm-Barr said. “Parents have already starting calling us and asking about graduation details.”

She said the ability to accommodate the graduates of all of the colleges at once is a positive change that will make the event larger and more exciting. Graduates and ceremony participants will be seated on a stage and on the field, while spectators will sit in the bleachers.

There is a concern, she said, but commencement will be held outdoors regardless of weather, unless it becomes dangerous. She said that the arena is still being worked out and will be announced on the commencement website, which will be updated soon. There will remain nearly the same, with State Farm Center lots available for the event.

“We’re just going to keep thinking posi-

I re-read some books every few years (“The Name of the Rose”; Bernard Cornwell’s “The Saxon series” – I wish I could invite him first. I read all the time — 80 books a year on average. As soon as I finish one book, I start another. Until I have read all the new books, I won’t even close.

I get to read marvelous manuscripts before they become books and to read the excellent books that my colleagues acquire. Those aside, I’ve enjoyed Claudia Johnson’s engaging “Jane Austen’s Cults and Cultures” and two superb biographies, Christoph Irmscher’s “Louis Agassiz: Creator of American Science” and Jeremy Adelman’s “Worldly Philosopher: The Odyssey of Albert O. Hirschman.” But most of my summer has been devoted to reading the works of Desiderius Erasmus in the Amsterdam edition of his “Opera Omnia,” with plenty of cribbing from the English translations in Toronto’s “Collected Works of Erasmus.”

We spend a summer with Erasmus? Many reasons. First of all, he was an as-

For more summer reading recommendations: go.illinois.edu/SummerReading13

Celia Mathews Elliott
director of external affairs and special projects, department of physics

OFF THE WEB

ILLINOIS

Updated Strategic Plan now online

Illinois was founded by a brilliant idea almost 150 years ago. Our foundations were laid with the prom-

Ilesanmi Adesida Provost

Pacifism and textual criticism. He edited the campus community,” she said. In addition to grant money, the ser-

ON THE WEB

commencement handed in one ceremony in one location in May 2014. The committee’s commencement cer-

Sack of Bones,” Tom Sawyer.) (“Lord Jim,” “Watership Down,” “For a

With the prom-
Energy saving renovations completed, more being considered

By Mike Helenthal
Assistant Editor

TWO high-impact building renovation projects employing an innovative financing approach that ties conservation funding to future energy savings are now finished.

Based upon early indications of success for the $32 million renovation projects, planners at Facilities and Services already are evaluating the efficacy of expanding the program to 18 more campus buildings.

“We’re still in the preliminary stages of studying the multiple systems, and it could be a rather large endeavor,” said Josh Whitson, an F&S engineer specialist. “Ideally, we could do it faster by grouping it into one process.”

The veterinary medicine project, completed in May, cost $22 million and is expected to recapture costs within 18 years. Some $18 million of the project was financed, with $2 million in funding coming from an approved student-fee contribution, $750,000 from F&S utilities and energy services and $250,000 from Vet Med.

The work included a long list of repairs, including ventilation and lighting systems upgrades, weatherizing work and laboratory fume hood exhaust replacement. The recently completed Oak Street chiller project, which included the installation of two large-tonnage high efficiency electric chillers to reduce the usage of the steam-powered chillers, cost $10.7 million.

Whitson said preliminary discussions about the 18 buildings in question for the next project have shown a varying scope of work — with a few buildings needing work at the scale of Vet Med and others needing less comprehensive energy-efficient upgrades such as ventilation, system controls and fume hood exhaust replacement.

The funding mechanism used for the Vet Med and Oak Street chiller projects, called energy performance contracting, is nearly as important as the energy-saving upgrades.

“This is just another tool for us to use to get the work done that needs to be done,” Whitson said.

Under the program, the university chooses from a list of pre-qualified energy service companies (ESCO), sometimes more than one for a project, and they’re selected based on projected energy savings derived from the upgrades. In the case of the Vet Med project, energy consumption is expected to be reduced by nearly 40 percent.

If the work doesn’t meet the energy-savings thresholds, the ESCO is responsible for making applicable repairs or making up the difference financially.

“It holds us to what we have accountability,” Whitson said. “It turns the project into a partnership where they have a vested interest in finding ways to improve efficiency and save money.”

The university has been successful in securing energy conservation grants. The Illinois Department of Commerce and Economic Opportunity funded $3 million for energy performance contracting and retro-commissioning projects in fiscal year 2013. Since 2005, the university has received about $12 million in grant funding from the IDCEO and the Illinois Clean Energy Community Foundation for campus projects.

Steve Breitwieser, the acting manager of external relations for F&S, said the energy-conservation initiatives have helped put the university ahead of the Illinois Climate Action Plan’s energy conservation goals while reducing consumption faster than peer institutions.

In addition to using ESCOs, F&S continues to upgrade metering systems to better monitor energy data.

“We’re a national leader in this and other universities have been looking to us to see how well the ESCO idea works,” he said. “It’s part of an overall strategy and we’ve proved it can be very effective.”

U. of I. named to Green College Honor Roll

By Allison Vance
Public Affairs

The U. of I. has been named to The Princeton Review’s 2014 Green College Honor Roll. It marks Illinois’ first appearance on the list, which includes 22 schools that attained a perfect score of 99.

“The campus has made a major commitment to sustainability,” said Pradeep Khanna, the assistant chancellor for public engagement. “This recognition is an endorsement of the campus to become more sustainable. In addition to newer buildings such as the LEED-certified Business Instructional Facility, improvements have been made to many existing buildings to increase energy efficiency. Many water fountains across campus also include a water spout that makes it easy to refill water bottles, cutting down on waste from plastic bottles. Faculty members also have modified many courses to incorporate sustainability principles. Illinois also had one of the most popular CourseRx offerings, “Introduction to Sustainability,” with more than 36,000 students enrolled in just a few weeks.

Stephanie Lage, the assistant director of the Center for a Sustainable Environment at Illinois, said the honor is also likely tied to progress on the university’s sustainability goals.

“The university has been successful in reducing water consumption by 20 percent by 2015, and it has already been cut by 19 percent,” Lage is quick to point out that the entire campus community deserves the recognition.

“The success is because of the efforts of everyone,” she said. “The person who turns off the computer at night, the person who brings their bike to work every day, the people who repair our buildings. Everyone has to do their part to achieve these goals.”

For more information about the university’s sustainability efforts visit the iCAP website.

Energy efficient Facilities and Services employees examine the new cooling tower during the final inspection at the Veterinary Medicine Building.

LOCALLY GROWN The U. of I. Sustainable Student Farm sells fresh produce on the Quad during the summer. One of the criteria for the Green College Honor Roll was that the “percentage of food expenditures that goes toward local, organic or otherwise environmentally preferable food.”

Ads removed for online version
Breastfeeding may protect against persistent stuttering

By Diana Yates
Life Sciences Editor

A study of 47 children who began stuttering at an early age found that those who were breastfed in infancy were more likely to recover from stuttering and return to fluent speech.

The analysis, reported in the Journal of Communication Disorders, found a dose-dependent association between breastfeeding and a child’s likelihood of recovering from stuttering, with children who were breastfed longer more likely to recover. Boys, who are disproportionately affected by stuttering, appeared to benefit the most. Boys in the study who breastfed for more than a year had approximately one-sixth the odds of developing persistent stuttering than boys who never breastfed, the team found.

The researchers, U. of I. speech and hearing science professor emerita Nicoline Ambrose and doctoral student Jamie Mahurin-Smith (now at Illinois State University), found no evidence that income or maternal education had any influence on stuttering in their sample. The researchers questioned the mothers about their children’s willingness and ability to breastfeed, and also found no evidence of an underlying neurological problem that could have inhibited the children’s ability to breastfeed and to speak fluently later in life.

“We’ve known for years that both genetic and environmental factors contributed to stuttering, but our understanding of the specific environmental variables in play has been murky,” Mahurin-Smith said. “These findings could improve our understanding of stuttering persistence and recovery.”

Several earlier studies had found “a consistent association between breastfeeding and improved language development,” the researchers report. A 1997 study found that babies breastfed for more than nine months had a significantly lower risk of language impairment than those breastfed for shorter periods of time. A later study found that infants who breastfed were more likely to produce “variegated babbling at earlier ages,” a key marker of healthy language development.

Other studies have found associations between the duration of breastfeeding and verbal IQ or a child’s likelihood of being diagnosed with an autism spectrum disorder. Ambrose and Mahurin-Smith suggest that essential fatty acids found in breast milk but often lacking in infant formulas may help explain why longer duration of breastfeeding is associated with better brain and language development.

“Long-chain fatty acids found in human milk play an important role in the development of neural tissue.”

–Jamie Mahurin-Smith

“Long-chain fatty acids in human milk play an important role in the development of neural tissue.”

–Jamie Mahurin-Smith

Ambrose and a colleague found that infants who were breastfed in infancy were more likely to recover from stuttering than those who weren’t.

“Fluent speech requires an extraordinarily complex sequence of events to unfold rapidly, and our hypothesis was that early differences in neurodevelopment could cause difficulties with speech fluency later in life.”

The infant brain triples in size in its first year of life, and “more than half of the solid weight of that newly built tissue will be lipid,” the researchers wrote. DHA is the fatty acid most prevalent in the mammalian brain. Infants lacking adequate DHA in the diet can synthesize it from other fatty acids, but “research shows that the rate at which DHA is incorporated into brain tissue outstrips the rate at which it can be synthesized.”

Multiple studies suggest that the lack of adequate DHA in development can impair brain structure and function, Ambrose said. Fatty acids also are known to influence gene expression, she said, binding to transcription factors that can regulate the activity of many genes.

“It may be that fatty acid intake affects the expression of genes responsible for stuttering,” Ambrose said.

“Our study adds to the evidence suggesting that human milk can exert a significant influence on neurodevelopment,” Mahurin-Smith said. “Although it’s not a magic bullet, it can make an important difference for children, even years after weaning.”

–Jamie Mahurin-Smith

Verbal advantage
U. of I. speech and hearing science professor emerita Nicoline Ambrose and a colleague found that infants who were breastfed in infancy were more likely to recover from stuttering than those who weren’t.

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Researchers develop new approach for studying brain cancer

By Diana Yates
Life/Science Editor

Human glioblastoma multiforme, one of the most common, aggressive and deadly forms of brain cancer, is notoriously difficult to study. Scientists have traditionally studied cancer cells in petri dishes, which have none of the properties of the brain tissue in which these cancers grow, or in expensive animal models.

Now a team of engineers has developed a three-dimensional hydrogel that more closely mimics conditions in the brain. In a paper in the journal Biomaterials, the researchers describe the new material and their approach, which allows them to selectively tune up or down the malignancy of glioma cells in a dish.

The new hydrogel is more versatile than other 3-D gels used for growing glioma (brain cancer) cells because it allows researchers to change individual parameters—such as porosity—and to adjust those traits individually will help researchers tease out important features associated with the initial growth and cell-cell interactions of glioblastoma, who led the study with postdoctoral researcher Sara Pedron and clinical therapies, said U. of I. chemical and biomolecular engineering professor Brendan Harley, who led the study with postdoctoral researcher Sara Pedron and graduate student Eftalida Becka. Harley is an affiliate of the Institute for Genomic Biology.

The researchers found that they could increase or decrease the malignancy of glioma cells in their hydrogel simply by adding hyaluronic acid, which is normally found in many tissues, especially the brain.

Hyaluronidic acid (HA) is a key component of the extracellular matrix that provides structural and chemical support to cells throughout the body. HA contributes to cell proliferation and cell migration, and local changes in HA levels have been implicated in tumor growth.

“I know that HA is one of the major building blocks in the brain,” Harley said. “The structure of a newly forming brain tumor has some of this HA within it, but there’s also a lot of the HA in the brain surrounding the tumor.”

The researchers found that they could have used hydrogels made out of nothing but hyaluronic acid to study gliomas, Harley said. “The problem is that HA is structurally not very interesting in itself. It’s structurally very often found in many tissues, especially the brain.”

So the researchers derived a material that contains adhesive sites allowed researchers to ask lots of questions about the response that’s closer to what you see in the brain.

“HA led to significantly enhanced malignancy,” Pedron said. “This material allows you to ask lots of questions about treatment methods for more malignantly or less malignant forms of glioma. It also will allow scientists to try to get a response that’s closer to what you see in the brain.”

In addition to showing that one size does not fit all when it comes to evaluating territory performance, the research shows that one size does not fit all in managing territories. Echambadi said.

“Researchers describe the new material and their approach, which allows researchers to change individual parameters—such as porosity—and to adjust those traits individually will help researchers tease out important features associated with the initial growth and cell-cell interactions of glioblastoma.”

In a forthcoming paper, Raj Echambadi, a professor of business administration, says firms should tailor their customer loyalty strategy to the market it serves. “This is where the one-size-fits-all approach fails,” Echambadi said.

Echambadi added that the market had some distinct characteristics unto itself, and all brands in the market had low repeat purchase rates. Echambadi said.

“Further analysis showed that, indeed, this was the case, which led the company to alter its pattern of local expenditures, its evaluations of local managers and even the strategic priority attached to the market.”

Echambadi said.

This includes that managers who wish to improve repurchase rates for a brand should place different relative emphasis on satisfaction and relational investments in different territories, to the extent that the brand’s market share is lower in those territories,” Echambadi said.

According to Echambadi, the research is applicable not just to the retail gasoline industry.

“If you’re a very large brand selling a homogeneous product to very disparate segments, or with a heterogeneous base, it’s impossible to satisfy every customer 100 percent of the time,” he said. “You have to pick and choose your battles.”

The paper was co-written by Rupinder P. Jindal, of the Milgard School of Business of the University of Washington, Tacoma, and Edward A. Blair, of the C.T. Bauer College of Business of the University of Houston.

All aglow Glioma (brain cancer) cells grow in a 3-D hydrogel. The green dye reflects the egatoplas of the cells.

Research approach U. of I. chemical and biomolecular engineering professor Brendan Harley, right, and postdoctoral researcher Sara Pedron found a way to adjust the malignancy of brain cancer cells in a newly developed polymer gel that mimics conditions in the brain.

By Phil Ciclera
Business and Law Editor

When evaluating the performance of a brand in a certain territory, it might be more appropriate to evaluate it against its local competitors as opposed to its performance in other territories, according to research from a U. of I. expert in business strategy.

“The forthcoming paper, Raj Echambadi, a professor of business administration, says firms should tailor their customer loyalty strategy to the market it serves,” Echambadi said.

“Loyalty in one particular territory, it might be more appropriate to evaluate it against its local competitors as opposed to its performance in other territories, according to research from a U. of I. expert in business strategy. “This is where the one-size-fits-all approach fails.”

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One-size-fits-all approach doesn’t work for different markets

Branding performance Firms shouldn’t follow a ‘one-size-fits-all-markets’ approach when evaluating and measuring the performance of a brand, says forthcoming research from Raj Echambadi, a professor of business administration at Illinois.

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When you extrapolate the research to other product categories, you might find that customer satisfaction and developing commitment through relational investments entail very different strategies, but you can’t do only one at the expense of the other. It’s a selective allocation of resources across those two levers, depending upon the market share.”

Firms may wish to choose a primary variable on which to focus, with the overall allocation depending on the cost effectiveness of each level, Echambadi said.

“If you’re a very large brand selling a homogeneous product to very disparate segments, or with a heterogeneous base, it’s impossible to satisfy every customer 100 percent of the time,” he said. “You have to pick and choose your battles.”

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Flammability of North American boreal forests increases

By Diana Yates
Life Sciences Editor

A 2,000-square-kilometer zone in the Yukon Flats of interior Alaska — one of the most flammable high-latitude regions of the world, according to scientists — has seen a dramatic increase in both the frequency and severity of fires in recent decades. Wildfire activity in this area is higher than at any other time in the past 10,000 years, the researchers report.

The researchers looked at the charcoal and pollen content of mud collected from the bottoms of 14 deep lakes in the Yukon Flats.

“We chose this area because today it is one of the most flammable boreal ecoregions of North America,” Hu said. “So we are focusing on periods of climate fluctuation during the Holocene. We’re trying to figure out what happened in the past to help us to project what may happen in the future.”

The Holocene epoch began about 11,700 years ago and continues to the present.

The team paid close attention to a particularly warm period in the Holocene. This period, called the Medieval Climate Anomaly (MCA), occurred about 1,000 to 500 years ago. Global temperatures and tree species in the Yukon Flats were similar during the MCA to conditions today.

“The period probably wasn’t as warm as today, definitely not as warm as it’s bound to get in the future, but may be the most similar to today,” Kelly said. “There was lots of burning, almost as much as today, and the fires were particularly severe.”

The researchers found that the composition of tree species in the Yukon Flats gradually shifted during the MCA — from forests dominated by coniferous trees to woodlands populated by relatively fire-resistant deciduous trees.

“That feedback from the vegetation prevented fire frequency from increasing much more than it already was,” Kelly said. “So there was a limit to fire frequency during the Medieval Climate Anomaly.”

The same kind of change in tree species is occurring today, Kelly said. Much of his study area has burned in the last decade, with young deciduous trees now growing where black space once stood.

Current wildfire activity in the study area, however, has already surpassed the limit seen during the MCA, Kelly said. The average fire frequency in this region during the last 3,000 years was nine or 10 fire events per thousand years. But in the last 50 years, the number of wildfire events has doubled, to almost 20 per 1,000 years, he said.

“That’s like a fire every 50 years, whereas in the past it was closer to a fire every hundred years,” Kelly said.

The findings are notable because boreal forests cover more than 10 percent of Earth’s land surface and contain a vast amount of carbon, primarily in the soil, Kelly said.

“There is more carbon in the boreal forests than in the atmosphere,” he said. “And one of the main ways that the carbon that’s accumulated over thousands of years gets out of the soil is through burning.”

The release of this carbon from fires adds to the greenhouse gases in the atmosphere, potentially leading to additional climate warming, he said.

“Rising temperatures can affect the greenhouse gases released from forest fires as burned recently — it’s already different than the vast majority of boreal forests,” Hu said. “The climate today appears to be warmer than in the past 10,000 years in that region, and we know that the climate is continuing to warm up.”

As warming continues, Hu said, it’s plausible that even deciduous forests will become highly flammable. “It’s wet,” he said. “It’s dry, it will burn.”

The research team included scientists from the University of Idaho, the University of Minnesota and the University of Washington. The National Science Foundation and a National Parks Ecological Research Fellowship supported this research.

Scientist, 98, challenges orthodoxy on causes of heart disease

By Diana Yates
Life Sciences Editor

Twenty years ago, at the age of 78, Fred A. Kummerow retired from the U. of I. That didn’t mean his research days were behind him, however. Now in a wheelchair, Kummerow still maintains a laboratory on campus where he and his colleagues chip away at the basic assumptions that guide most research into the causes of heart disease.

Kummerow is an adjunct professor of comparative biosciences, Kummerow has an uncommon view of the dietary and lifestyle factors that contribute to atherosclerosis and sudden cardiac death. He shared those views in an interview with Hannah Wilson, an intern for Clinical Lipidology, a publication of the London-based Future Medicine publishing company.

Contrary to advice offered to most patients, Kummerow maintains that dietary cholesterol, like that found in eggs, meat or milk, is not a danger to the heart.

“Fried foods and powdered food substitutes are dietary sources of oxysterols, which alter the phospholipid membranes of our arteries in ways that increase the deposition of calcium, a key hallmark of atherosclerosis,” Kummerow said.

Based on the misconception that high cholesterol was responsible for heart disease, pharmaceutical companies started developing drugs to lower the levels of cholesterol in patients with hypercholesterolemia, he said. In my view, the biggest setback in heart disease treatment has been the oversimplification of the role of dietary cholesterol in contributing to heart disease.

“Fried foods and powdered food substitutes are dietary sources of oxysterols, which alter the phospholipid membranes of our arteries in ways that increase the deposition of calcium, a key hallmark of atherosclerosis,” Kummerow said.

Kummerow is also a long-time advocate for the thoroughness of the Mediterranean diet (those based on the hydrogenation of soybeans) from the food supply. His research has shown that dietary trans fats accumulate in the tissues and interfere with the production of prostacyclin, a naturally occurring factor in the blood that keeps it fluid, preventing dangerous blood clots.

DisPELLING misCONCEPTIONS

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Testing for cholesterol levels such as testing for cholesterol levels such as...
Journalism professor Brant Houston
on the sale of The Washington Post

Editor’s note: On Aug. 5 came the news that The Washington Post was being sold to Amazon founder and CEO Jeff Bezos. In an online column the next day for The Conversation website, journalism professor Brant Houston called the sale “perhaps the proverbial tipping point in U.S. print journalism,” and possibly a signal of turnaround in the news industry. Others, however, have questioned Bezos’ motives and raised concerns about the direction he might impose on the paper. Houston is the Knight Chair in Investigative and Enterprise Reporting at Illinois, and has closely followed the digital transition — and digital missteps — of the news business. He talked with News Bureau social sciences editor Craig Chamberlain.

Why do you see this as such a potentially promising development? What does Bezos bring to this that could alter the downward trend seen at the Post — as well as other papers — in staff, subscribers and profits?

As a billionaire, Bezos could bring a much-needed infusion of cash that could ensure the Post could adapt more thoroughly to the digital media world. He also has shown he is willing to take the long view, taking years to develop and carry out a business strategy. And he now has years of successfully selling and distributing meaningful content to the public.

Newspapers have often been portrayed as victims of new media. But you suggest that this sale might get newspapers to “fully accept (that) it fought technology and technology has thankfully won.” What do you mean?

Newspapers — both on the editorial and the business sides — were not only slow to recognize the value of the Web, digital tools and data analysis, but the old guard also saw the new digital world as irrelevant, threatening and bothersome. The owners refused to put any significant money in training their staffs to use the technology. In fact, they continue to include some of the digital staff in ongoing layoffs.

With this purchase by Bezos, it would be hard to deny that the digital world has won and that this is the only way that newsrooms as we have known them can be saved or salvaged in any way after the wholesale staff cuts in the industry. Nearly a third of the 56,000 editorial jobs in the U.S have been eliminated in the past decade and the cuts continue, with hundreds laid off in just the past two weeks.

Does embracing technology mean giving up on print entirely? Has any news organization figured out how to be profitable online only, or integrating both online and print?

History has shown that most media are not completely replaced by the latest media, that previous versions take on a much lesser role. What is interesting about the Web, however, is that it can incorporate all the basic pieces of news content — text, audio, video and photographs — in a dynamic way, unlike other media before. Bezos has said he can’t see a newspaper, in hardcopy form, existing in 20 years.

Some newspapers are still making a profit, although not the 40 percent of some in their heyday. Some would be making a profit if they weren’t carrying heavy debt acquired when purchased, or if they weren’t beholden to investors obsessed with quarterly earnings. And some are making a profit with both online and print.

But the readers who grew up reading newspapers only in print are disappearing with each passing year while the digital platforms seem only to increase for the younger generation. There is something to be said at present for still having a medium such as a newspaper that doesn’t require you to log on or find a good Wi-Fi connection, but its days of dominance have passed.

The sale of the Post to Bezos is also the most recent in a line of actual and rumored newspaper sales to wealthy individuals again, some of whom people who made their money outside the news business. Some of those have already been losing that kind of news ownership at least could buy journalists and society some time to figure out the new business model.

Furthermore, the previous and current owners have not, despite some very sincere efforts and hard work, been able to find a new business model that works. That means that we have been facing a possible future with few voices, or no voices at all, that can provide credible news and analysis, hold government and businesses accountable, and look out for citizens who don’t dwell in the houses of power. We have already been losing that kind of news over the past two decades. The new direction in ownership at least could buy journalists and society some time to figure out the new business model.

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Renowned artists celebrate extraordinary range of the guitar

By Dusty Rhodes
Arts and Humanities Editor

ow many different kinds of sounds can come out of an instrument with just six strings? ELLNORA: The Guitar Festival will provide some answers Sept. 5-7 (Thursday-Saturday) at Krannert Center for the Performing Arts.

The lineup for this year’s edition of the popular biennial event features American axe artists, including Dweezil Zappa, who will re-create his father Frank’s “Roxy & Elsewhere” album; Lucinda Williams, winner of three Grammy Awards and named America’s best songwriter by Time magazine; Buddy Guy, Rock and Roll Hall of Fame member and winner of six Grammy Awards; bluegrass legends Sam Bush and Del McCoury, and the youngest and only female on Rolling Stone’s 2006 list of “New Guitar Gods,” Kaki King.

They will be joined by guitarists from around the world, such as Stephane Wremble, the French-born Gypsy-jazz guitarist based in Austin, Texas; and Gyan Riley, described by a writer for The Boston Globe as “a nimble guitarist with an exploratory ear and a technique steeped in both Western and Indian classical traditions.”

Eleven of the festival performances will be presented free of charge, including a $271 for senior citizens, $130 for students, $271 for senior citizens, $130 for students, $90 for Illinois students and youth).

All performances take place in one of Krannert Center’s seven performance spaces, ranging from the formality of Foellinger Great Hall, with its renowned acoustics, to the casual vibe of the outdoor amphitheater and the tented Sonic Garden. ELLNORA (originally called Wall to Wall Guitar Festival) is named in honor of Ellnora Kranert, who oversaw every phase of the center’s design and construction. Food and beverage will be available on-site, and the Studio Store, offering souvenir merchandise and opportunities to meet the artists.

A festival pass grants admission to all ticketed events except the Dan Zanes and Friends show on Sept. 7 for $314 or less ($271 for senior citizens, $130 for students, $90 for Illinois students and youth).

The opening night party on Sept. 5 (Thursday), offers a bargain appetizer platter of festival bands, with a $5 ticket giving audience members a pass to hear concerts by Australian blues guitarist Fiona Boyes with her trio; the gospel/blues/rock/funk “sacred steel” band The Lee Boys; Grammy Award-winning blues guitarist Jonny Lang; Bush and McCoury; and Wremble.

Single tickets for all other events range from $10 to $48, and are on sale at the Krannert Center ticket office and at ELLnoraGuitarFestival.com, by email at kran-tix@illinois.edu or by phone at 1-800-527-2849.

This year’s artist-in-residence is popular three-time ELLNORA alumna Cindy Cashdollar, a Dobro and steel guitarist based in Austin, who has worked with Dave Alvin, Bob Dylan, Van Morrison and Rod Stewart. She won five Grammy Awards for her work with Asleep at the Wheel. Cashdollar will collaborate with a variety of ELLNORA artists, including Dan Zanes and Friends and with session guitarist Kevin Brey’s Sisters Euclid, the jazz/folk/rock band that has had a weekly gig at Toronto’s Orbit Room for more than a dozen years.

At 3 p.m. on Sept. 6 (Friday), Spanish flamenco guitar master Paco Peña will deliver the keynote address through an interview with classical guitarist Jason Vieaux. Peña, who has been playing professionally since age 12, has toured internationally, recorded 29 albums and written numerous compositions for guitar. Vieaux, who has made 11 albums ranging from the music of jazz great Pat Metheny, is on the faculties of the Curtis Institute of Music and the Cleveland Institute of Music.

In residence At right, Cindy Cashdollar, a Dobro and steel guitarist based in Austin, Texas, is this year’s artist-in-residence. She is a popular three-time ELLNORA alumna who has won five Grammy Awards for her work with Asleep at the Wheel. Cashdollar will collaborate with a variety of ELLNORA artists.

The Globe Trotters above, Buddy Guy, Rock and Roll Hall of Fame member and winner of six Grammy Awards, is among the two dozen guitarists from around the world performing at ELLNORA, The Guitar Festival.
WILL-TV special, ‘Medicare Man,’ remembers Dan Perrino

In Champaign-Urbana, the 1960s era left behind more than broken glass and half musical footage from previous WILL-TV specials produced between 1982 and 2005. New interviews include vocalists Dena Vermette and Abby Crull, former U. of I. associate dean of students Willard Broom; former U. of I. Alumni Association director Lou Liay; band members Don Heitler, Gregg and Jeff Helgesen, Carl Johnson, Jordan Kaye, Rick Murphy and Morgan Powell; Chip McNeill, the chair of the U. of I. jazz studies program; Scott Schwartz, the U. of I. archivist for music and fine arts, and Dan’s wife, Marge Perrino. Songs performed by Medicare in the program include “Tailgate Ramble,” “Wolverine Blues,” “I Can’t Get Started With You,” “I Wish I Was in Peoria,” “Sugar Blues,” “Tin Roof Blues,” “Come Sunday” and “When the Saints Go Marching In.”

Chambana Science Café

Bryan White to talk Sept. 4

The Chambana Science Café has announced its schedule of newly informal gatherings that bring scientists out of their labs to public areas to talk about their work and answer questions. Talks are scheduled for the first Wednesday of every month and are free and open to the public.

“The series begins Sept. 4 with Bryan White, a professor of animal sciences, the director of microbe projects in the Division of Biomedical Sciences and a professor in the Institute for Genome Biology. White will discuss his latest research on the human microbiome in health and disease at 5:30 p.m. at the Champaign Public Library in Robeson Pavilion Room C.

Future presentations: Preethi Jyothi, a postdoctoral fellow at the Beckman Institute, on automatic speech recognition (Oct. 2); Abha Singharoy, a postdoctoral fellow at the Beckman Institute, on combining computer simulations with X-ray crystallography to image proteins in action (Nov. 6); and Jana Diestner, a professor of library and information science, on social network analysis and studying the data traces people leave behind every day (Dec. 4).

All presentations begin at 5:30 p.m. For more information, visit the Chambana Science Café Facebook page at facebook.com/ChambanaScienceCafe.

The series is sponsored in part by the Beckman Institute for Advanced Science and Technology.

‘Smarter Brains’

Beckman faculty members featured

As a part of the Beckman Institute for Advanced Science and Technology, Edward McAuley, a professor of kinesiology and community health, and Gillian Cooke, a Beckman postdoctoral researcher, are featured in “Smarter Brains,” a program to be broadcast on WILL-TV at 9 p.m. Aug. 21. (The program also will be broadcast at 1 p.m. Aug. 17, 1 a.m. Aug. 18, 1 p.m. Aug. 19 and 3:30 a.m. Aug. 21.)

The program explores the amazing science behind human intelligence and how it shapes enjoyment of the world around us. Using inspirational stories, computer-generated illustrations and interviews with researchers and experts, the program shows how anyone can use everyday techniques and skills to keep themselves smart, active and vibrant throughout their lives.

McAuley focuses on relationships among physical activity, aging and psychological function.

Cooke is a Swim and Play Chair and a professor of psychology and neuroscience. McAuley is also a professor of psychology and is a member of the human perception and performance group at Beckman. His primary research agenda focuses on topics related to physical activity, aging and psychological function.

Advanced Nano/Biosystems

Interdisciplinary symposium is Sept. 25-27

The Beckman Institute for Advanced Science and Technology, are among the speakers for the Interdisciplinary Symposium on Advanced Nano/Biosystems: Design, Fabrication and Characterization, which will be Sept. 25-27 at the Frederick Seitz Materials Research Laboratory.

Nano/biosystems have emerged as highly interdisciplinary research areas in the last few decades, spanning physics, chemistry, biology, mechanics and material science. Synergistic design, device fabrication and system characterization from the nanoscale is of fundamental interest. The symposium will provide a stimulating forum for recent advances in material design, fabrication and characterization techniques, including experiments, theories, computations and modeling.

For more information on the conference and the speakers, and to register, visit publish.illinois.edu/advancednano-biosystems/

University YMCA

Dump and Run sale is Aug. 24-25

The University YMCA will host its 12th annual Dump and Run sale Aug. 24-25 at the Stock Pavilion. The event is designed to reduce trash volume and give students and community members an inexpensive option for purchasing household items. Proceeds from the sale benefit the University YMCA’s mission, events and programs.

The sale will be 8 a.m.-4 p.m. Aug. 24 with 82 admis-
sion, and 11 a.m.-2 p.m. Aug. 25 with a $3 bag sale and half-price furniture. Items will be offered for free 2:30-4 p.m. on Aug. 25.

Memory lane

Dunn Perrino performs with students

WILL’s Tim Meyers, will include about half interviews of members of Graystone Blue, an all-male jazz band organized in 1964 by Dan Perrino. Perrino died a year ago, and his friends and colleagues have had time to reflect on his legacy and that some time has passed,” said WILL’s Les Schulte, the University YMCA’s director of community relations.

Perrino died a year ago, and his friends and colleagues have had time to reflect on his legacy and that some time has passed,” said WILL’s Les Schulte, the University YMCA’s director of community relations.

Memorial service for Dan Perrino will be 1 p.m. Aug. 15 at First Presbyterian Church, 214 S. Charter St., Mon-

Deaths


Mac H. Corray, 94, died Aug. 4 at Williamsville Health and Rehab, Crawfordsville, Ind. He worked at the U. of I. for 26 years, retiring in 1972 as a sheet metal worker at the Physical Plant.

James R. Gallivan, 86, died July 30 at his Cham-
paign home. He worked at the U. of I. for 32 years, retiring in 1988 as the university director of risk management and benefits. Memorials: St. Jude Children’s Hospital, sjude.org.

Deanna M. Leonard, 56, died Aug. 3 at her Cham-
paign home. She worked at the U. of I. for 18 years, retiring in 2004 as a clerk for Facilities and Ser-

Donna L. Sarver, 75, died Aug. 9 after Monticello home. Sarver worked at the U. of I. for 13 years, retiring in 2004 as a secretary IV for the School of Chemical Sciences. Memorials: Faith in Action, First Presbyterian Church, 214 S. Charter St., Mon-

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Insideillinois Aug. 15, 2013
Gene Robinson receives Animal Behavior Society award

By Chelsey B. Coombs
News Bureau

Gene Robinson, Swannlund Chair of entomology and neuroscience and the director of the Institute for Genomic Biology at the U. of I., is the recipient of the Animal Behavior Society’s 2013 Distinguished Animal Behaviorist award.

Robinson is best known for his studies of the mechanisms and evolution of social behavior in the Western honey bee. He has developed a paradigm that integrates behavioral studies, endocrinology, neuroscience, genomics and evolution to explore various types of social behavior, including aggression, communication and socially regulated behavioral maturation.

“More generally, my laboratory is interested in understanding the complex relationships between genes and social behavior — that is, how do genes influence neural function to affect behavior, and in turn, how does the social environment ‘get under the skin’ to affect the genome, the brain and the resulting behavior,” Robinson said. “Genomics provides powerful resources for this endeavor, and we are careful to stay abreast of the latest developments so we can employ the best technologies to address these key questions.”

During his career, Robinson has written or co-written more than 250 published articles, and he led the effort to sequence the genome of the honey bee.

In her nominating letter for Robinson, Joan E. Strassmann, a professor of biology at Washington University in St. Louis and a former president of the Animal Behavior Society, wrote: “Robinson is the very best kind of scientist. He asks and answers big questions in behavior. He brings to bear a broad variety of tools and levels of investigation. He mentors others carefully so they flourish after they leave his group.

“What he has done is more than just create innovative structures for all to research bees. He has personally greatly advanced the field of behavior with his own research.”

As part of the ceremony involving his award, Robinson gave a plenary talk at the 50th annual conference of the Animal Behavior Society in Boulder, Colo., on Aug. 1.

Robinson is a fellow of the Animal Behavior Society and has previously been honored as a University Scholar, a member of the Center for Advanced Study, a Fulbright fellow and a Guggenheim fellow. He was elected to the National Academy of Sciences in 2005; in 2009, he received the National Institutes of Health Pioneer Award.

The Animal Behavior Society was founded in 1964 to advocate for the study of animal behavior in both the field and the laboratory. The society’s annual conference took place from July 28 to Aug. 1. The society has awarded the Distinguished Animal Behaviorist Award since 1992 in recognition of scientists’ outstanding lifetime achievement in research. Past winners include Richard Dawkins, William D. Hamilton and Edward O. Wilson.

Top honors Gene Robinson, the Swannlund Chair of entomology and neuroscience and the director of the Institute for Genomic Biology, is the recipient of the Animal Behavior Society’s 2013 Distinguished Animal Behaviorist award.

The late William J. Fry is credited with the initiation of the field of therapeutic ultrasound, and through the development of some of the earliest medical ultrasound imaging systems, he is credited with introducing ultrasound to detect disease. A longtime member of the Illinois faculty, Fry worked at the Naval Research Laboratory on underwater sound during World War II.

Charles P. Slichter joined the Illinois faculty in 1949 and is a professor emeritus. Internationally recognized as one of the world’s top condensed matter physicists, he has been a leading innovator in applying magnetic resonance techniques to understanding the structure of matter for more than 50 years.
Aaron Ebata on coping with military deployments

The American Academy of Pediatrics is urging military and civilian pediatricians to be attuned to the potential impact that military parents’ deployments and returns may have on their children’s mental health. What have you learned in your research with military families?

While the report in (the journal) Pediatrics focuses on the risks and difficulties that children might face and the mental health consequences of parental military deployment and returns, we’ve found in our research that these situations also present opportunities for growth and development.

Children tell us about all the things that change when a parent gets deployed, but kids also tell us there are some positive things that come out of it. The family often gets closer. They learn skills or become more independent. They find the support of folks around them. They get to experience new and different things because of their involvement with the military.

We tend to focus much more on the risk side of things, and for important reasons, but we need to focus a little bit more on factors that promote resilience in families and kids. And our work with military kids will really help us understand how families in different kinds of stressful situations can successfully cope and then grow from those experiences.

When do situations such as lengthy deployments, difficult reintegrations or surviving a natural disaster compromise children’s well-being?

An important issue to look at is all the disruptions in relationships, roles and routines that happen. Many things change when a military parent leaves, so there’s a period of adjustment then, but there’s also adjustment when they return. The greater the disruptions in the family’s daily routines, relationships and roles, the more likely it seems to be that kids will have difficulties – especially if it means having less emotional support and less time in activities that bring enjoyment or relief.

When a parent in the military is deployed or returns, what can families do to ease those transitions?

Like adults, kids try to cope by trying to understand the situation and feel like they have some kind of control. They also want closeness and connection with parents, but might have a hard time saying so. Kids tell us that it’s really important to them that parents spend extra time with them.

When a parent returns from deployment, kids may be more needy or clingy because they are trying to re-establish the connection that they had with that parent previously. They need to know that the returning parent is also adjusting and might be grumpy or impatient sometimes.

In wartime, children often have incomplete understandings of what it all means. They might want to ask questions, but parents might not want or be able to talk about it, and that causes some difficulty. The returning parent sometimes has to make difficult decisions about what information to share.

We found that spouses often try to avoid certain topics to protect the relationship, but this undermines being able to connect with each other at a time when having that connection is really important.

There are times when being able to do fun things together outside of the home in a different setting can relieve some of the stress and make it easier to connect again. Outdoor activities like camping can make it easier. U. of I. Extension’s Operation: Military Kids program provides activities such as summer camps for kids and events for the whole family.

What coping strategies help disaster survivors?

A lot of the traumas and difficulties in these situations are exacerbated when the disruptions cause isolation, overwhelm the parents or when children are put in situations with a lot of conflict. When we worked with children that were affected by the massive flooding in Illinois in 1993, and victims of the tornado that struck Ogden and St. Joseph a few years later, we found that being able to carry on the routines or ‘normal activities’ provided the kids with an arena of comfort and support that was really important and helpful.

Other researchers have confirmed that returning parent sometimes has to make difficult decisions about what information to share.

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having these sources of support and being able to carry on the routines really seems to predict better outcomes.

Another important aspect is whether kids can positively re-frame or create meaning out of the difficulties they are experiencing. These meanings are often filtered through families.

After the floods, some families were able to reframe the situation and focus on the positives. Kids talked about seeing examples of the goodness of human kind, such as when National Guardsmen or volunteers from another state drove out with their pump truck to pump out flooded basements. Kids also learned that families were important and that adversity can make people stronger and draw family members together.

When events happen like the recent bombings at the Boston Marathon, adults can focus on the positive things that people have done, such as heroic acts by bystanders or first responders. They can also discuss how important it is to help, to trust, to be able to count on other people and to be one of those people who make a positive difference.

And it’s similar with military families during deployments. Point out where people help and make a positive impact and discuss with kids that the deployed parent – and their family – is doing something that really is important.

Whatever the circumstances, kids need to feel that the contributions they are making are meaningful and important and that their responsibilities are reasonable and not overwhelming. That helps them develop a sense of competence, feel that they’re contributing and that whatever they’re going through has some good to it.