

Dr. Boris Kovatchev

April 6, 2013

“Why do Doctors Need Math to Treat Diabetes?”



Kids' Tech
University
at Virginia Tech



VirginiaTech

Virginia Bioinformatics Institute

Thank you to all of our supporters!

Your generous support helps to make
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We would also like to extend our gratitude to our
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Thank you for helping to make Kids' Tech
University 2013 a success!

Volunteers

Our volunteers include many members from the
Virginia Tech and Blacksburg community

Additional Support is always welcomed. If you would like to help
us provide this exciting opportunity for children, please contact:

Dr. Kristy Collins

540-231-1389

kdivitto@vbi.vt.edu

<http://kidstechuniversity.vbi.vt.edu/>

About the Program

The **primary goal** of Kids' Tech University (KTU) is to help grow the future workforce in **science, technology, engineering, and mathematics (STEM)** by sparking kids' interest in these disciplines.

KTU's curriculum features three parts:

Interactive Sessions

- where children meet scientists and learn about their research

Hands-On Activities

- that give children the opportunity to learn about research projects across the VT campus and beyond

Online Virtual Labs

- which allow continued exploration of science topics at home.
<http://ktu.vbi.vt.edu/>

April 6th Agenda

9:45 AM

Parents drop off their children for the **interactive session** in McBryde Hall 100

10:30 - 11:45 AM

Kids enjoy an interactive session led by Dr. Kovatchev titled "**Why do Doctors Need Math to Treat Diabetes?**" in McBryde Hall 100

Parents are invited to view the event in a satellite location, over a live video feed, in Torgersen Hall 2150 or 3100

11:45 AM

Parents pickup their children and kids receive a Hokie Passport lunch card containing \$6.00 for **lunch** at one of the specified dining halls on campus.

Keep the lanyard and nametag, a sticky label is in the back of their lanyard which will be used for the hands-on activity.

1:30 - 3:30 PM

The children will be escorted by their parents to the **hands-on portion** of the event, being held at the Math Emporium in the University Mall. There the students will take part in an online activity. Parents/guardians are responsible for bringing their registered KTU child(ren) to the hands-on activity in the Math Emporium; **only children with their KTU lanyard will be allowed in the Math Emporium.**

1:30 pm- Drop off child at the Math Empo; look for a sign corresponding to the child's last name and sign them in with a volunteer (i.e. give the volunteer one of your preprinted sticky labels).

1:30-3:30 pm- Children will be in the Math Empo taking part in an online activity.

During this time, Dr. Reinhard Laubenbacher will be in an adjacent room in the Math Emporium speaking and answering questions about "**Math and Science in Our Everyday Lives**" for parents.

3:30 pm- Pick up child at the same sign where you dropped them off.

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Real scientists...

Answering real questions at Virginia Tech...



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E-mail: sshort@vt.edu www.outreach.vt.edu

January 18, 2013

Kids' Tech University Participants:

Welcome to Blacksburg, the Virginia Tech campus, and to Kids' Tech University!

Kids' Tech University, with interactive sessions and exciting hands-on events, is designed to create the future workforce in science, technology, engineering, and mathematics (STEM) by sparking an interest in these fields for you and your child. We are currently in our fifth year of offering the program through the coordination of the Virginia Bioinformatics Institute (VBI), Virginia 4-H, and the Roanoke-Blacksburg Technology Council (RBTC).

Virginia Tech has a strong commitment to connecting national prominence in research and discovery to advance quality STEM programs across the Commonwealth. Kids' Tech University is just one example of this commitment.

As Virginia Tech's Associate Vice President for Engagement, I am delighted to welcome you to such a successful project and hope that you and your child are inspired and leave with great excitement and interest in the STEM disciplines. Thank you for your involvement in this unique program and best wishes for continued success.

Sincerely,

Susan E. Short, Ph.D.
Associate Vice President for Engagement

/kr

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Dr. Boris Kovatchev

April 6, 2013 | Interactive Session

“Why do Doctors Need Math to Treat Diabetes?”

WHEN WE EAT candy, chocolate, ice cream, or cereal, the sugar from these foods enters our bodies and is then “burned” with the help of a hormone called insulin to give us energy to move around. In fact, our brains eat mostly sugar, so without sugar we won’t be able to even think. This is called “metabolism” – the engine that makes us tick. Kids and adults who have diabetes don’t make enough insulin, so they need additional insulin injections to make their bodies work. How much, however, is very important – less insulin or more insulin can cause all kinds of trouble, and can be even deadly. So, doctors need Math to be able to precisely tell how much and when to inject insulin. And when it comes to computers that inject insulin, then the Math becomes even more important and more complicated.



IN THIS TALK we’ll learn how Math can help treat diabetes, and even make possible an amazing device – the artificial pancreas – which will one day take care of kids and adults with diabetes safely and automatically.

DR. KOVATCHEV is Professor in the Department of Psychiatry and Neurobehavioral Sciences and Adjunct Professor of Systems and Information Engineering, University of Virginia, Charlottesville, Virginia, Head of Section Computational Neuroscience, and Director of the University of Virginia Center for Diabetes Technology. He received Ph.D. in Mathematics (Probability and Statistics) from Sofia University “St. Kliment Ohridski,” Bulgaria in 1989. His research expertise is in Biomathematics, specifically modeling of biologic and behavioral processes. Kovatchev has a 18-year track record in translational diabetes research and is the recipient of the Diabetes Technology Leadership Award for 2008. He is principal investigator of three large projects related to the design of artificial pancreas: (i) Modular Bio-Behavioral Closed-Loop Control of T1DM, NIH/NIDDK RO1 DK 085623 (2009-14), (ii) the JDRF Artificial Pancreas Project at UVA (2006-14), and (iii) “Ambulatory artificial pancreas: merging physiology, behavior, and control design” - NIH Diabetes Impact Award (DP3) at UVA (2011-16). Kovatchev is author of 123 peer-reviewed scientific publications, and holds 36 U.S. and international patents and 62 patents currently pending. In 2011 he was named UVA Edlich-Henderson

Hands-on Activity

Managing Diabetes with Math

AT THE MATH EMPORIUM

After Dr. Boris Kovatchev's interactive session on April 6th, students will use the computers in the Math Emporium to learn about diabetes from a mathematical point of view.

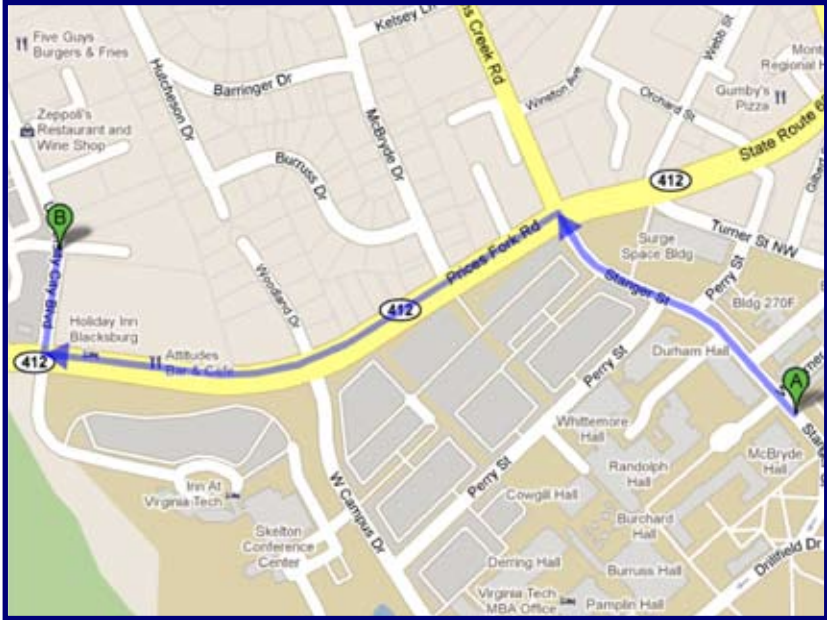


Dr. Reinhard Laubenbacher,

KTU President and a Professor at the Virginia Bioinformatics Institute and in the VT Mathematics Department, will be in an adjacent room in the Math Emporium speaking and answering questions about **"Math and Science in Our Everyday Lives"** for parents.

Driving Directions

Driving directions from McBryde Hall to the Math Emporium



FROM GOOGLE MAPS

START FROM

McBryde Hall
Blacksburg, VA 24060

1 - Head northwest on Stanger St toward Prices Fork Rd
(ABOUT 0.3 MILES)

2 - Turn left onto Prices Fork Rd
(ABOUT 0.5 MILES)

3 - Turn right onto University City Blvd (ABOUT 400 FEET)

The Math Emporium is on the left, in the shopping area/mall. Parking can be found in the parking garage.

END AT

Virginia Tech Math Emporium
University Mall
801 University City Blvd
Blacksburg, VA 24060

LATITUDE & LONGITUDE: 37.2337,-80.4342

Educator Workshops

We are excited to offer Recertification Points in conjunction with the KTU program.

Educators will learn it, teach it, and take it back to the classroom.

Interact with:

- Scientists
- Technology Experts
- Engineers
- Mathematicians

You will engage in an exciting, hands-on teaching experience, and then apply what you learned in a unique, first-hand teaching environment with 3rd-7th graders. You will also be able to participate in ongoing community blogs and network with other teachers and education specialists.

This program is ideal for elementary and middle school teachers, out of school time educators, or others interested in STEM teaching.

As a result of the workshops, students have the opportunity for exposure to current and relevant research. They will benefit from their teacher's ability to connect research back to classroom content standards through intentional programming.

Educator Workshop Contacts

Dr. Kathleen Jamison
4-H Youth Dev. Curriculum & Learning
(540) 231-9411
jamisonk@vt.edu

Katie LaFon
Virginia 4-H State Events
Coordinator
kapatter@vt.edu

Please visit
<http://kidstechuniversity.vbi.vt.edu/>
for further information.

THANK YOU for joining us for the 5th annual Kids' Tech University at Virginia Tech. Since 2009, Kids' Tech University has brought science, technology, engineering, and mathematics to kids (ages 9-12). We look forward to seeing you in 2014!



KTU is a program at
Virginia Tech with
one primary goal: creating the future
workforce in

Science,
Technology,
Engineering,
and **Mathematics**

by sparking kids' interest in these fields.



KTU 2013 Program Dates

Jan 26 | Technology Day

Feb 23 | Science Day

Mar 23 | Engineering Day

Apr 06 | Math Day

Contact

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Dr. Kristy Collins

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kdivitto@vbi.vt.edu

We look forward to
seeing you in 2014!



THE FUTURE OF SCIENCE



VirginiaTech
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