

# Kids' Tech University

2011 Program at Virginia Tech



January 29, 2011

"Patterns are Everywhere! How and Why?"

with Dr. Reinhard Laubenbacher



I am 

THE FUTURE OF SCIENCE



VIRGINIA  
BIOINFORMATICS  
INSTITUTE  
AT VIRGINIA TECH



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Your generous support helps to make  
Kids' Tech University possible!

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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

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The goal of Kids' Tech University is to spark interest and excitement about **Science, Technology, Engineering, and Mathematics** in children between the ages of 9 -12. KTU's curriculum features three parts:

## STORYTELLING SESSION

- Held once a month from January to April, in a lecture hall on the Virginia Tech campus

## HANDS-ON ACTIVITY

- Held after each storytelling session
- Focused on the specific discipline being discussed in the storytelling session

## VIRTUAL LAB

- Activities that are designed to cultivate children's interest in the lecture topics - <http://ktu.vbi.vt.edu/>
- Performed at home after the day's events

# JAN 29<sup>TH</sup> AGENDA

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10:00 AM

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

10:30 AM - 12:00 PM

Kids enjoy a storytelling session led by Dr. Reinhard Laubenbacher titled "**Patterns are Everywhere! How and Why?**" in McBryde Hall 100

*Parents are invited to view the event in a satellite*

*location, over a live video feed, in Torgersen Hall 2150*

12:15 PM

Kids receive a Hokie Passport lunch card containing \$6.00 for **lunch** at one of the specified dining halls on campus

1:20 - 4:00 PM

For the Jan 29th **hands-on activities**, we are splitting up the program participants into two groups decided by the first letter of each child's last name. Each "group" will report to an assigned venue and then (after a time limit) the two groups will switch locations.

# TABLE OF CONTENTS

## WELCOME LETTER ..... 3

Dr. John Dooley, VT

## JANUARY 29<sup>TH</sup> STORYTELLING SESSION ..... 4

## JANUARY 29<sup>TH</sup> HANDS-ON ACTIVITIES ..... 5

After the Jan. 29th storytelling session, there will be 2 separate hands-on, interactive, events. At these events, the kids will have the opportunity to put the concepts that they learned in Dr. Laubenbacher's storytelling session into action.

### **Dancing with the stars: what's math got to do with it?**

AT THE VCOM CONFERENCE CENTER IN THE VIRGINIA TECH CORPORATE RESEARCH CENTER (CRC) WITH CO-INSTRUCTOR PROF. CARA RAWLINGS, THEATER ARTS DEPARTMENT

### **Hunting for patterns**

AT THE MATH EMPORIUM IN THE UNIVERSITY MALL

## TEACHER WORKSHOPS ..... 11



Real scientists...

Answering real questions at Virginia Tech...

January 14, 2011

Parents and Participants of Kids' Tech University:

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

Kids' Tech University, with informative lectures and exciting hands on events, is designed to ignite an interest in Science, Technology, Engineering and Mathematics (STEM) disciplines for you and your child. We are currently in our third year of offering the Kids' Tech University program through the coordination of Virginia Bioinformatics Institute (VBI) and Virginia 4-H and the leadership of Dr. Kristy Collins, Dr. Reinhard Laubenbacher and Dr. Kathleen Jamison.

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 Vice President for Outreach and International Affairs, I am pleased to welcome you to such a successful program hope you and your child leave with great excitement and interest in the disciplines of Science, Technology, Engineering and Mathematics.

Sincerely,



John E. Dooley, Ph.D.  
Vice President for Outreach and International Affairs

/s/

*Invent the Future*

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

# DR. REINHARD LAUBENBACHER

JAN 29, 2011 STORYTELLING SESSION

## "Patterns are Everywhere! How and Why?"

**DID YOU KNOW** that we are surrounded by patterns--everywhere? For example, farmers need to understand weather patterns to plan their harvests. Your parents need to understand traffic patterns to drive you to school safely. Music and dance excite us through patterns of sounds and movement. Some patterns are pretty easy to spot, like the pattern on seashell, or the pattern on a snowflake. However, other patterns around us aren't so easy to see, like the patterns on a pine cone, or the patterns of ocean waves. I'll bet you wouldn't guess patterns exist in clouds!



**TO DISCOVER** some of these patterns, we need to be very, very observant. So join me and together we'll hunt down some patterns in the world around us--and as we investigate how these patterns form and why they're there, the answers may surprise you!

**DR. LAUBENBACHER** has been a Professor at the Virginia Bioinformatics Institute and a Professor in the Department of Mathematics at Virginia Tech since 2001. He is also an Adjunct Professor in the Department of Cancer Biology at Wake Forest University in Winston-Salem (NC) and Affiliate Faculty in the Virginia Tech Wake Forest University School of Biomedical Engineering and Sciences. Prior to these appointments Dr. Laubenbacher was Professor of Mathematics at New Mexico State University. He has served as Visiting Faculty at Los Alamos National Laboratories, was a member of the Mathematical Science Research Institute at Berkeley in 1998, and was a Visiting Associate Professor at Cornell University in 1990 and 1993. Current interests in Dr. Laubenbacher's research group include the development of mathematical algorithms and their application to problems in systems biology, in particular the modeling and simulation of molecular networks. An application area of particular interest is cancer systems biology, especially the role of iron metabolism in breast cancer.

# HANDS-ON ACTIVITIES

## INSTRUCTIONS

For this date we are splitting up the program into two groups by first letter of the child's last name ("**A-L**" and "**M-Z**" group). Each group will report to a different venue and then switch.

### **If your child's last name starts with A-L:**

**1:20 PM** Drop off child at the Math Emporium in the University Mall; child will be assigned to a group number on premises, (you will receive a tag with a group number at this site).

**1:30-2:30 PM** Children will be in the Math Emporium taking part in an online activity

**2:30 PM** Pick up child; Look for Group number sign in the center of the University Mall. You will need to sign out your child.

**2:50 PM** Go to the VCOM Conference Center in the Corporate Research Center. Here you will sign your child into another group onsite (you will receive another tag with a group number). The children will be doing an activity in the conference center. Dr. Reinhard Laubenbacher (that morning's storyteller) will be in an adjacent room talking to the parents.

**3:00-4:00 PM** Children will be in the VCOM Conference Center; parents will be in lecture space adjoining the center.

**4:00 PM** Parents pick up children

### **If your child's last name starts with M-Z:**

**1:20 PM** Go to the VCOM Conference Center in the Corporate Research Center. Here you will sign your child into a group onsite (you will receive a tag with a group number at this site). The children will be doing an activity in the conference center. Dr. Reinhard Laubenbacher (that morning's storyteller) will be in an adjacent room talking to the parents.

**1:30-2:30 PM** Children will be in the VCOM Conference Center; parents will be in lecture space adjoining the center.

**2:30 PM** Parents pick up children via group number; look for sign being held by a volunteer with that group number

**2:50 PM** Drop off child at the Math Emporium in the University Mall; child will be assigned to a group number (you will receive a tag with a group number at this site).

**3:00-4:00 PM** Children will be in the Math Emporium taking part in an online activity.

**4:00 PM** Pick up child; Look for Group number sign in the center of the University Mall. You will need to sign out your child.

# HANDS-ON ACTIVITIES

## Dancing with the stars: what's math got to do with it?

AT THE VCOM CONFERENCE CENTER IN THE VIRGINIA TECH CORPORATE RESEARCH CENTER (CRC)

WITH CO-INSTRUCTOR PROF. CARA RAWLINGS, THEATER ARTS DEPARTMENT

- There are mathematical patterns everywhere, even in the way we dance! Learn how your movements can be arranged in mathematical patterns in order to choreograph dance moves.
- Dr. Reinhard Laubenbacher (that morning's storyteller) will be in an adjacent room giving a presentation to the parents:  
**Lecture and Question & Answer session on: Math and Science in Our Everyday Lives**

## Hunting for patterns

AT THE MATH EMPORIUM IN THE UNIVERSITY MALL





# HANDS-ON ACTIVITIES - LOCATIONS

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 at Prices Fork Rd/  
State Route 685 (ABOUT 0.5 MILES)

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

The Math Emporium is on the left, in the shopping area/mall.

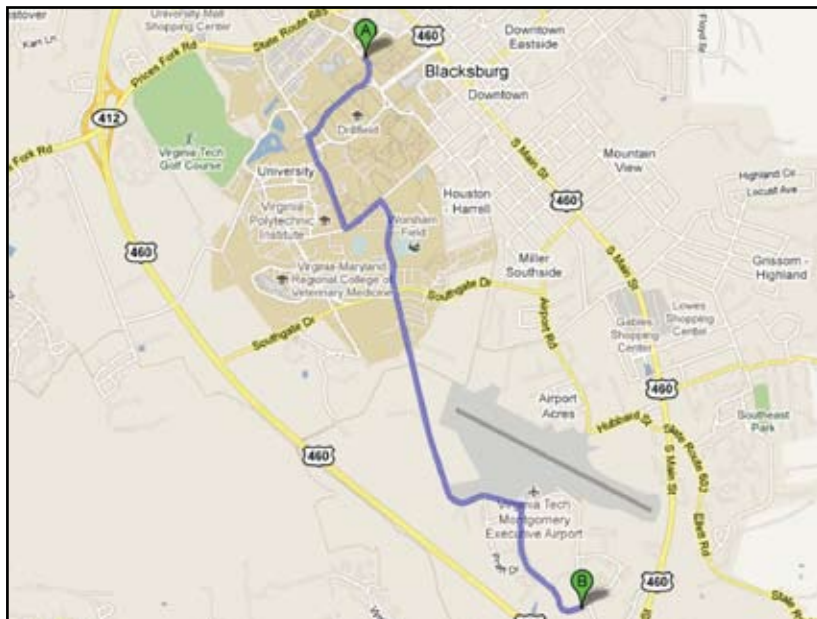
Parking can be found in the parking garage.

END AT

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

# HANDS-ON ACTIVITIES - LOCATIONS

Driving directions from McBryde Hall to the VCOM conference center



FROM GOOGLE MAPS

START FROM

**McBryde Hall**  
**Blacksburg, VA 24060**

**1 - Head southeast on Stanger St toward Drillfield Dr**

(ABOUT 0.1 MILES)

**2 - Slight right at Drillfield Dr**

(ABOUT 0.2 MILES)

**3 - Slight right toward W Campus Dr** (ABOUT 381 FEET)

**4 - Turn left at W Campus Dr**

(ABOUT 0.4 MILES)

**5 - Turn left at Washington St SW** (this turn is a traffic circle)

(ABOUT 0.2 MILES)

**6 - Turn right at Spring St**

(ABOUT 0.4 MILES)

**7 - Continue onto Tech Center Dr** (ABOUT 1.2 MILES)

**8 - Turn right at Kraft Dr**

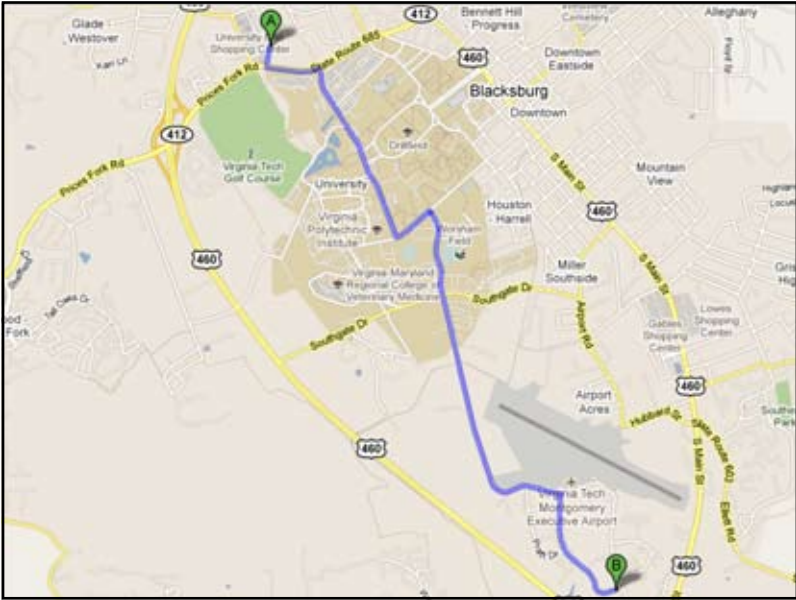
(ABOUT 0.6 MILES)

END AT

**2280 Kraft Dr**  
**Blacksburg, VA 24060**

# HANDS-ON ACTIVITIES - LOCATIONS

Driving directions from the Math Emporium to VCOM conference center



FROM GOOGLE MAPS

START FROM

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

**1 - Head south on University City Blvd toward Prices Fork Rd/State Route 685 (ABOUT 400 FEET)**

**2 - Take left onto Prices Fork Rd/State Route 685 (ABOUT 0.2 MILES)**

**3 - Take the 1st right onto W Campus Dr (ABOUT 0.8 MILES)**

**4 - Turn left at Washington St SW (this turn is a traffic circle) (ABOUT 0.2 MILES)**

**5 - Turn right at Spring St (ABOUT 0.4 MILES)**

**6 - Continue onto Tech Center Dr (ABOUT 1.2 MILES)**

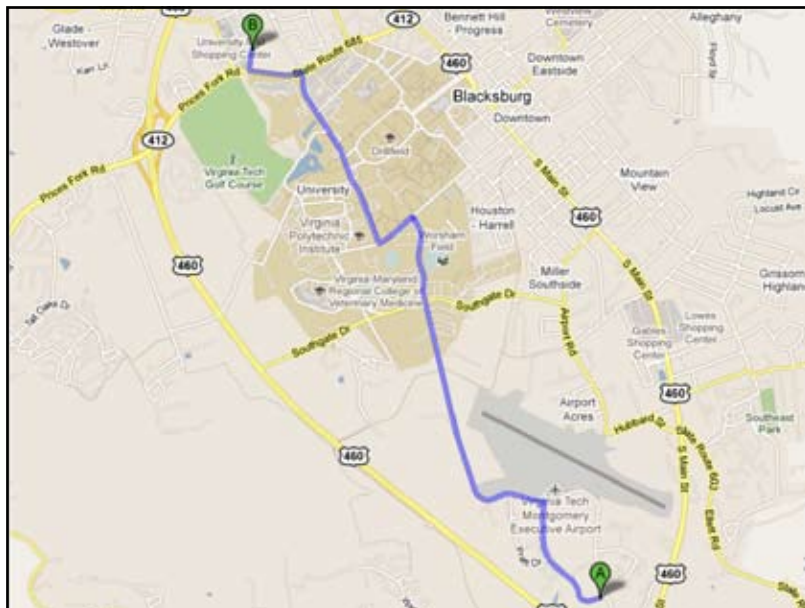
**7 - Turn right at Kraft Dr (ABOUT 0.6 MILES)**

END AT

**2280 Kraft Dr  
Blacksburg, VA 24060**

# HANDS-ON ACTIVITIES - LOCATIONS

Driving directions from VCOM conference center to the Math Emporium



FROM GOOGLE MAPS

START FROM

**2280 Kraft Dr  
Blacksburg, VA 24060**

- 1** - Head west on Kraft Dr toward Pratt Dr (ABOUT 0.6 MILES)
- 2** - Turn left at Tech Center Dr (ABOUT 1.2 MILES)
- 3** - Continue onto Spring St (ABOUT 0.4 MILES)
- 4** - Turn left at Washington St SW (ABOUT 0.2 MILES)
- 5** - Turn right at W Campus Dr (this turn is a traffic circle) (ABOUT 0.8 MILES)

**6** - Turn left at Prices Fork Rd/  
State Route 685 (ABOUT 0.2 MILES)

**7** - Take 1st 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**

WE ARE EXCITED to offer CEU (Continuing Education Unit) credits for teachers in conjunction with the KTU program.

**Teachers 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-6th 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, or others, interested in STEM teaching.

## WORKSHOPS

### Day 1 (day before KTU program)

- Interact with Scientists, Technology Experts, Engineers, and Mathematicians
- Includes a 4-hour interactive hands-on training

### Day 2 (day of KTU program)

- You interact with KTU students at learning stations to deploy what was learned in Day 1
- You watch a lecture given to kids on topics related to Day 1, led by a world renowned research scientist
- You will learn how to incorporate fundamentals and concepts from the lecture and training into your classrooms

## COST

Virginia 4-H is paying the registration fee for the first 10 participants for each workshop. Register early to hold your spot for February, March, and April! The cost per workshop is \$30. However, if there is a hardship please let us know by emailing, Dr. Kristy Collins.

# JANUARY KTU TEACHER WORKSHOP

## "Patterns with nature: Math concepts explained"

WORKSHOP INSTRUCTORS: DR. REINHARD LAUBENBACHER AND DR. KATHLEEN JAMISON

**January 28, 12:30-4:30pm & January 29, 9am-4:30pm**

CEU credits offered- 1.1

Have you ever heard that math is the universal language? That it is constant and can define the world around us? Find out more about mathematical patterns that are all around us, and how math can help us to find patterns in nature with this January teacher workshop. In this workshop teachers will learn about the math concepts that are applicable to nature and the various online learning tools that may be brought into the classroom.



Please visit  
<http://kidstechuniversity.vbi.vt.edu/>  
for further information, and to  
register for the next KTU Teacher  
Workshop.



**KTU** is a program at Virginia Tech with one primary goal – sparking kids' (ages 9-12) interest in --

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



## KTU 2011 PROGRAM DATES

**Jan 29** | Math Day  
**Feb 26** | Engineering Day  
**Mar 26** | Technology Day  
**Apr 09** | Science Day

## CONTACT

**Dr. Reinhard Laubenbacher**  
VBI at Virginia Tech  
reinhard@vbi.vt.edu

**Dr. Kristy Collins**  
VBI at Virginia Tech  
kdivitto@vbi.vt.edu



We look forward  
to seeing you  
in February!

**VOI** VIRGINIA  
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