

Infinite Possibilities: Profiles of Summer Research from
the Gatton Academy of Mathematics and
Science in Kentucky

Volume Four - Summer 2014

© 2014 by Deanna M. Jenkins. The book author retains sole copyright to his or her contributions to this book.

Photography by Clinton Lewis, University Photographer, WKU and Bryan Lemon, Assistant University Photographer, WKU

The Blurb-provided layout designs and graphic elements are copyright Blurb Inc., 2012. This book was created using the Blurb creative publishing service. The book author retains sole copyright to his or her contributions to this book.





THE GATTON ACADEMY OF MATHEMATICS AND SCIENCE IN KENTUCKY

Infinite Possibilities: Profiles of Summer Research
from the Gatton Academy of Mathematics
and Science in Kentucky



Volume Four - Summer 2014





About the Gatton Research Internship Grant Program

The Gatton Academy of Mathematics and Science in Kentucky created the Gatton Research Internship Grant program in 2010. Made possible from a gift from Mr. Carol Martin “Bill” Gatton, the program offers grants to Gatton Academy students between their junior and senior years to support summer research internships across the Commonwealth, the USA, and the world. By providing a funding mechanism, the program directly creates research internships that otherwise would not have existed for Gatton Academy students. In its first five years, the program has made possible 75 research internships for Gatton Academy students to study STEM problems in their area of interest in a devoted, full-time research setting.

The program’s successes are being realized, as several students who were supported in the summer of 2013 by Gatton Research Internship Grants went on to be recognized in prestigious scholarship competitions. Isaac Kresse became a semi-finalist in the Siemens Competition for his research, while Nitin Krishna and John Andrew Cliburn won Goldwater Scholarships, and Gretchen Walch was named a Goldwater Scholarship Honorable Mention.

In the summer of 2014, the program is funding 20 rising high school seniors who attend the Gatton Academy—including its first international internship! Performing research in clean energy production, application development for the latest smart devices, nuclear physics, and lung cancer, just to name a few, these students are helping answer science’s unknowns. The following pages feature the summer of 2014 Gatton Research Internships Grant recipients.



Dear Mr. Gatton,

What exceptional learning you make possible for the students at the Carol Martin Gatton Academy of Mathematics and Science in Kentucky with your support and gift! Gatton Academy juniors have worked in laboratories in various locations this summer, and they have used these opportunities to enhance their high school experiences which are truly unusual for these exceptional students.

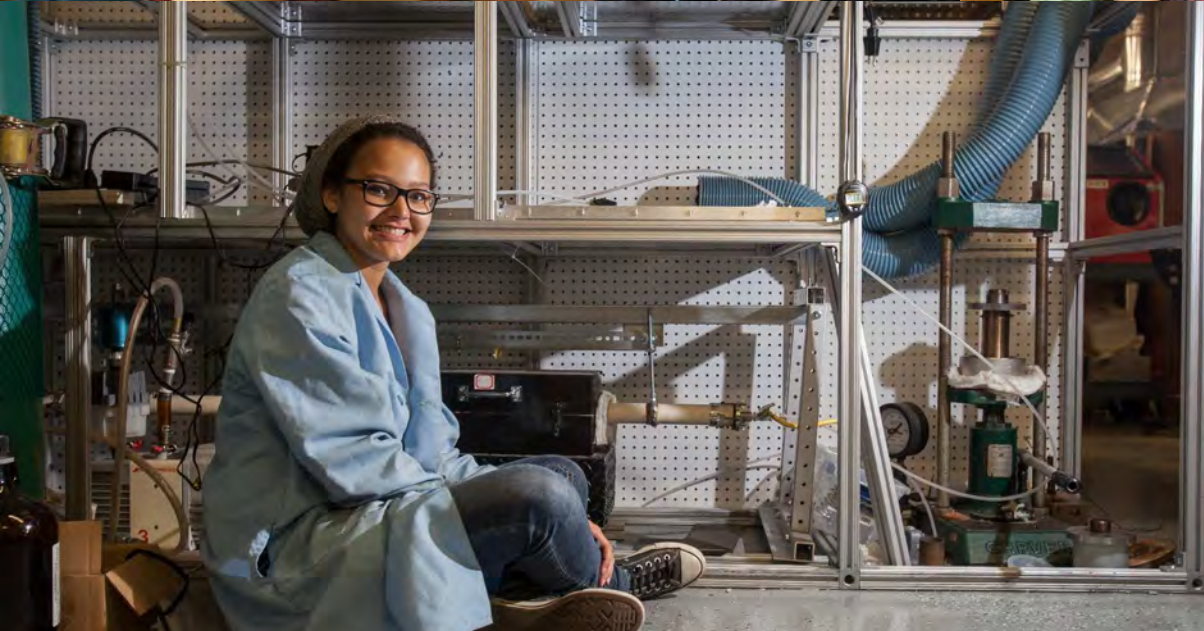
You will read the descriptions of these research experiences that each of the Gatton Academy students has written for you and that have been compiled in this book. Each student has selected summer research that ties in with his or her interests in science, technology, engineering, and mathematics. Each has made this summer experience one that will enhance the learning he or she will engage in as a Gatton Academy senior.

Thank you so much for the many ways you support the Gatton Academy, our very special school. It is indeed a place where exceptional high school students are engaging in a college experience at WKU. You are helping create a bright future for each of them as well as a bright future for citizens of Kentucky, the United States, and the globe.

Sincerely,

Julia Link Roberts

Mahurin Professor of Gifted Studies
Executive Director, The Gatton Academy





Dana Biechele-Speziale
Grayson, KY (Carter County)

Research Topic:

Thermogravimetric
Characteristics of Coal-derived
Graphene Oxide Composites
via Ball Milling

Research Area: Chemistry

Research Location:

Western Kentucky University,
Institute for Combustion
Science

Research Mentor:

Dr. Yan Cao

Career Goal:

Attorney for Chemical
Company

Home High School:

East Carter County High
School

Extracurricular Activities:

Volleyball, Tennis

**Coollest Thing About
Summer Research:**

*"Getting to work with all of the
equipment in the lab."*

*"My favorite Gatton Academy
memory is when I was on fourth
floor listening to our former
director, Tim Gott, talk about life.
He was talking about how special
life truly is, and somewhere in his
speech he said, "It doesn't have to be
perfect to be balanced." This quote
has inspired me to try and accept
whatever has been thrown at me
and do everything I can to not let it
throw me off balance."*

*"Most of my classmates from my
home high school are planning their
summer trips to an amusement
park or the beach. They're turning
their 6:00 am alarm off and
relaxing poolside all day. As for
me, I'm turning the alarm back to
5:45 am, driving to research and
trying to make a difference in the
chemistry world."*



"I'm most looking forward to presenting my research at different conferences in the fall. I've never presented my research before, yet it is something I am passionate about. I want the world to know why we're doing what we're doing."

- Dana



Morgan Blair
Morehead, KY (Rowan County)

Research Topic:

Water Testing to Identify
Sources of Contamination

Research Area:

Environmental Biology (Water
Testing)

Research Location:

Morehead State University,
Department of Biology and
Chemistry

Research Mentor:

Dr. Geoffery Gearer

Career Goal: Engineer**Home High School:**

Rowan County Senior High
School

Extracurricular Activities:

Academic Team, Odyssey of
the Mind, Future Business
Leaders of America

**Thoughts About Your
Second Year at Gatton:**

*"I am most excited to meet all
the juniors and help them
adjust the way the seniors
helped me."*

*"Having lived in the same town my
entire life, I never really had to meet
new people or make new friends.
However, once I got adjusted, I started
loving the Academy, and I feel just as
comfortable at Gatton as I do at home.
The Academy has truly become a
second home for me. It has a loving
environment with amazing people."*

*"The Academy has taught me to be
more independent. Because I have a
twin sister, we are always a pair in my
hometown. The Academy has allowed
me to establish an identity that is
uniquely my own."*

"My first semester was really rough for me, and the fact that I was able to do as well as I did was a huge accomplishment for me. Learning from that, I was able to achieve a 4.0 the next semester."

- Morgan





Samuel Booth
Owensboro, KY (Daviness County)

Research Topic:

Knot Theory and Program Development for Theoretical Mathematics

Research Area: Mathematics

Research Location:

Western Kentucky University,
Department of Mathematics

Research Mentor:

Dr. Claus Ernst

Career Goal:

Financial Analyst

Home High School:

Owensboro Catholic High
School

Extracurricular Activities:

Chess Club, Fitness Club, Beta
Club, Robotics Club

**Coollest Thing About
Summer Research:**

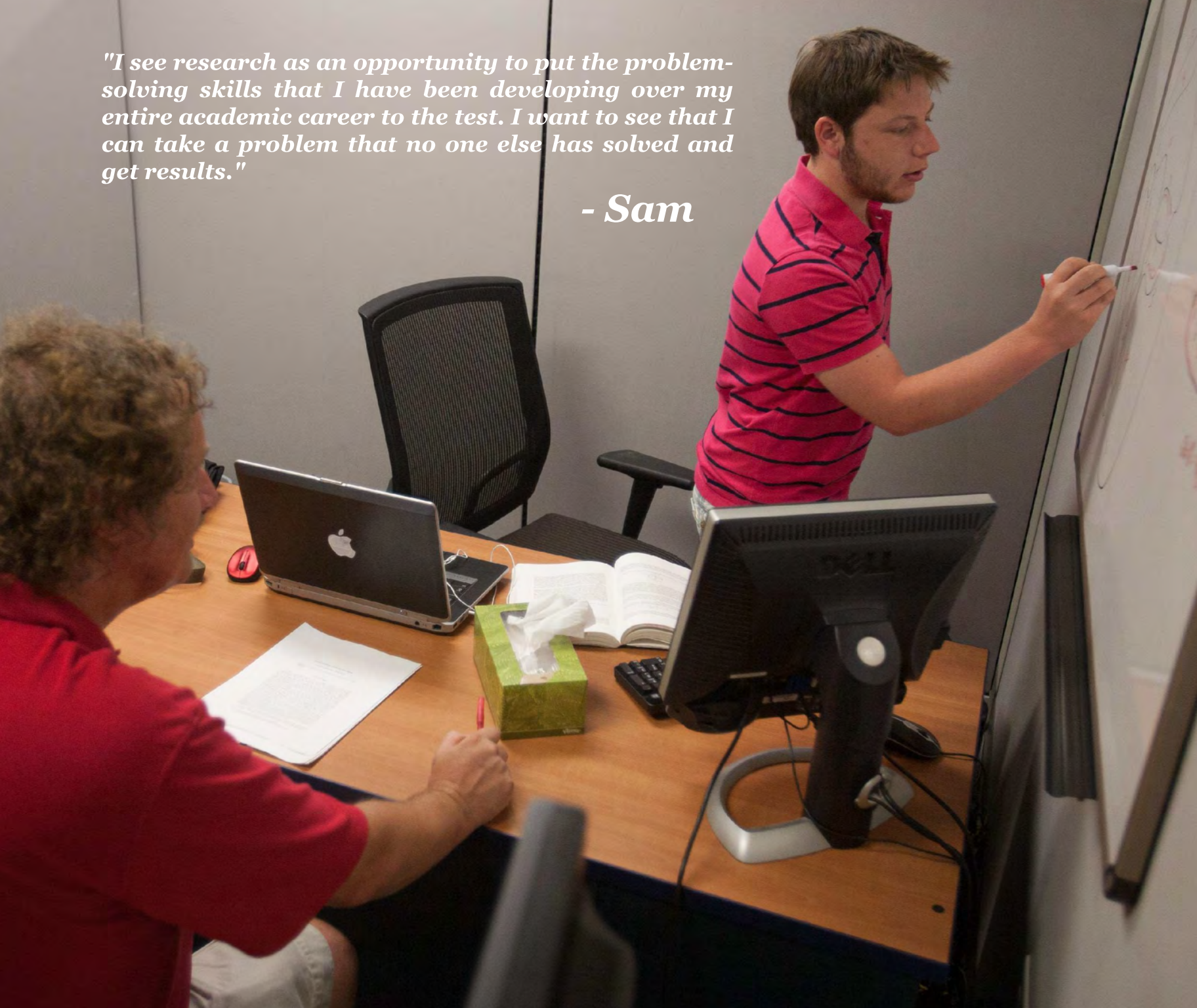
*"Being able to have my own
office area where I can work
on my research."*

"On the first day at the Gatton Academy I was eager to prove my worth to my new peers. Now I understand that each person has individual talents that can be appreciated. The people that I have met have done nothing but help me with my studies and form stronger friendships than some that I formed over many years at my previous school."

"The Gatton Academy helps all Kentuckians, even students who cannot access higher level courses who wish to challenge and advance themselves. In an age where competition for good jobs and schools is rising, the Gatton Academy prepares those who wish to compete with the best from larger cities and access to more resources."

"I see research as an opportunity to put the problem-solving skills that I have been developing over my entire academic career to the test. I want to see that I can take a problem that no one else has solved and get results."

- Sam





Andrew Brown
Central City, KY (Muhlenberg County)

Research Topic:

Plasma Physics for Magnetic Fusion Energy

Research Area:

Plasma Physics

Research Location:

Los Alamos National Laboratory (New Mexico)

Research Mentor:

Dr. Xianzhu Tang

Career Goal: Physics

Professor

Home High School:

Muhlenberg County High School

Extracurricular Activities:

Saxophone, Tutoring, Boy Scouts

Coollest Thing About Summer Research:

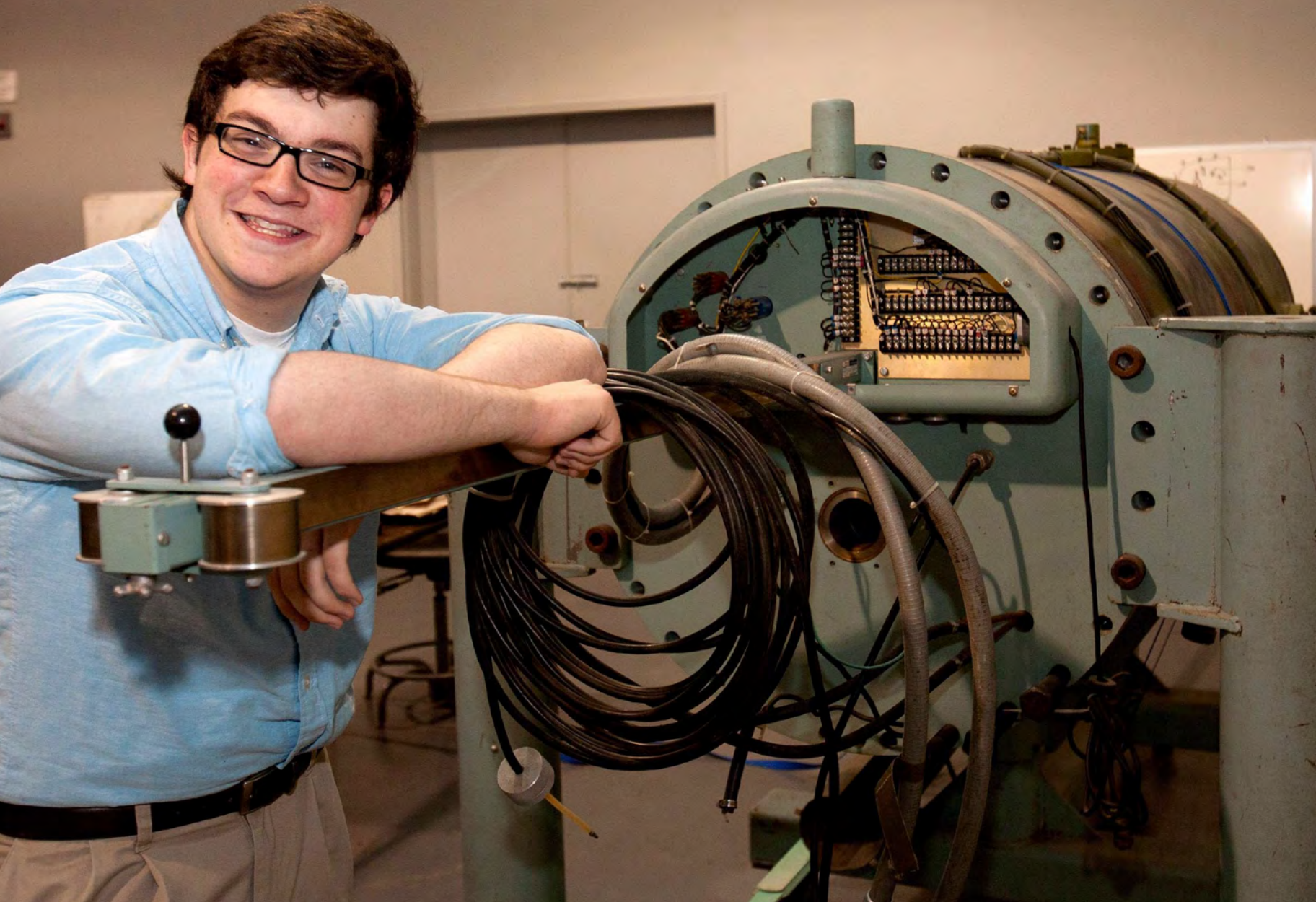
"The sign above the refrigerator where I keep my lunch says: "This refrigerator is for food only! Please do not store any chemical or radioactive waste here."

"My dream job is to work at the International Thermonuclear Experimental Reactor currently in construction, which will be the largest fusion effort in history. My summer research is uniquely oriented to that interest, while granting a more general foot in the door to the realm of academia."

"More than anything else, I'm looking forward to the town of Los Alamos. Los Alamos National Lab, the birthplace of the atomic bomb, houses thousands of researchers working on projects ranging from the Human Genome Project to inertial confinement fusion. The sheer variety and depth of expertise are staggering."

"Research is a breath of fresh air. We spend years being told about science. To participate in science as an organic process of questioning rather than knowing is thrilling."

- Andrew





Justin Bunch
Elizabethtown, KY (Hardin County)

Research Topic:

Lung Cancer Metabolism

Research Area:

Oncology, Specifically Lung Cancer

Research Location:

University of Kentucky,
Markey Cancer Center

Research Mentor:

Dr. Theresa Fan

Career Goal: Cardiologist,
Neurologist, or Oncologist

Home High School:

Elizabethtown High School

Extracurricular Activities:

Beta Club, Yearbook Club,
WKU's Microbiology Club

Best Advice From Your Mentor:

"Due to the fact that I am a minor, I had to have special forms signed by my parents. My research professor said, 'Don't be offended, but apparently the university thinks that you're a minor.'"

"While I am still in the beginnings of my particular research project, the coolest part would have to be the fact that I get to fulfill my life long dream of conducting research that directly benefits the medical field. I find it extremely cool that I am able to interact in the lab with others who have traveled from different parts of the world to conduct research here. There are researchers here from Brazil, China, and Germany."

"The thing I love most about the Gatton Academy would have to be the many opportunities that the Academy offers its students. Before I attended the Academy, I had no idea that high school students were able to even conduct research. The Academy has also allowed me to explore more about myself and what I truly stand for, which has helped me so much during this past year."

"In the next ten years, I aspire to achieve my lifelong goal of being accepted into a medical school. While there are many other tasks that I would like to accomplish within the next ten years, this is the most important one to me because it will allow me to accomplish my career goal of becoming a cardiologist, neurologist, or oncologist."

- Justin





Erin Burba
Paducah, KY (McCracken County)

Research Topic:

Cellulosic Biofuel Stock Crops
on Arbuscular Mycorrhizal
Fungi

Research Area: Biology**Research Location:**

University of Kentucky,
Department of Biology

Research Mentor:

Dr. Sarah Emery

Career Goal:

Engineer or Computer
Scientist

Home High School:

Paducah Tilghman High
School

Extracurricular Activities:

Band, Orchestra, Speech Team,
Beta Club

**Favorite Part of the
Summer Experience:**

*"I'm really enjoying getting
new lab experiences, and
hopefully I'll discover
something that will help future
switchgrass farmers."*

*"As a child, I played with dirt. Now I get to
play with dirt, write about it, and call it
science! I've always wanted to explore
various renewable energy sources. With
this experience, I will have a deeper
understanding of the factors involved in
creating a biofuel system with minimal
impacts on the environment."*

*"My favorite Gatton Academy memory so
far has been the trip to Costa Rica. I
learned so much about everything from
bromeliads to pumas, ate a lot of arroz con
pollo and casado, and connected with 15 of
my wonderful classmates. One night, I
even got to help a baby leatherback turtle
out to sea!"*



"Research allows me to begin experimentation and scientific thought at a young age, which will give me a strong foundation for developing and testing ideas as I advance into my career."

- Erin



Lydia Buzzard
Hopkinsville, KY (Christian County)

Research Topic:

Using Google Glass to Develop
an App for WKU

Research Area:

Computer Science

Research Location:

Western Kentucky University,
Department of Computer
Science

Research Mentor:

Dr. Uta Ziegler

Career Goal:

Software Engineer

Home High School:

Heritage Christian Academy

Extracurricular Activities:

Tae Kwon Do, Guitar, Writing,
Baking Cakes

**Something Most People
Don't Know About You:**

*"I qualified for the CTF
Taekwondo National
Championships twice and
placed second both times."*

"Throughout my research experience, I've learned to develop for Android smartphones as well as for Google Glass. As an aspiring software engineer, it's important to be proficient in programming for a variety of relevant devices. I believe that gaining an understanding of two such devices this summer will help me to reach my professional goals by laying a firm foundation on which to build the future programming experiences I'll have. Computer Science is an ever-changing field. I'll never know everything about it, but I love taking in as much as I can."

"I've learned that competitions of knowledge and memorization are unnecessary and unhealthy, that they crown no victors and award no prizes--especially not here. Where my classmates and I come from, we're all the "best" at something. After one year at the Academy, I no longer feel obligated to "size up" the students in every room I walk into. Now, I have the sense to love them."



"At the Academy, I have found friends and mentors who have accepted me and allowed me to explore and discover my niche in a judgment-free environment. No year has shaped my confidence and self-worth for the better as much as my first year at the Gatton Academy. "

- Lydia



Brian Carlson
Stanford, KY (Lincoln County)

Research Topic:

Programming to Develop a Model
Intermolecular Fluorescence with
Resonance Energy Transfer

Research Area:

Forster Resonance Energy
Transfer (FRET)

Research Location:

Western Kentucky University,
Department of Physics and
Astronomy

Research Mentor:

Dr. Wieb VanDerMeer

Career Goal:

Aerospace Engineering or
Materials Science

Home High School:

Lincoln County High School

Extracurricular Activities:

Running, Learning

Next Year at Gatton:

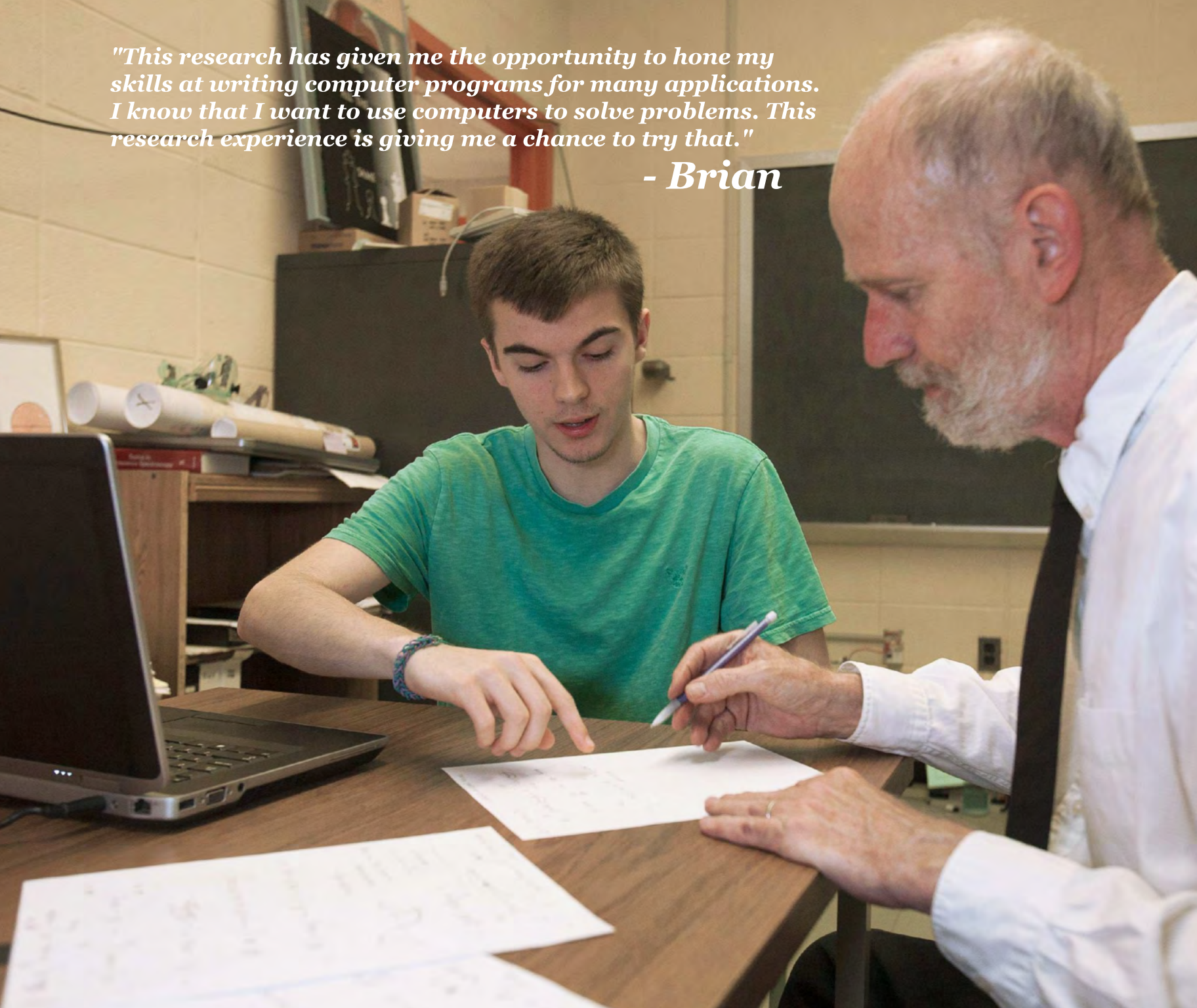
*"I'm looking forward to being
able to use the study habits I've
learned my first year. I felt like it
took me a full year to develop the
skills I need and learn the lessons
I need to succeed in the rest of my
college experience."*

*"My favorite Gatton memory is the last
run-through of my Computer Science
class's final project. It was such an
amazing feeling to see all of my partner's
and my hard work come to fruition. After
spending countless hours on it, it felt
amazing to see it completed and working."*

*"Before the Gatton Academy, I was
frustrated by the limited scope of what my
town had to offer me in terms of
education. Now, I can learn from some of
the brilliant minds from around Kentucky
living in the same building as me, and I
can learn from the WKU professors. The
Gatton Academy gave me opportunities
that I had never had before."*

"This research has given me the opportunity to hone my skills at writing computer programs for many applications. I know that I want to use computers to solve problems. This research experience is giving me a chance to try that."

- Brian





Benjamin Guthrie
Bowling Green, KY (Warren County)

Research Topic:

Studying Micro-sized Nuclear Power Sources

Research Area:

Nuclear Physics

Research Location:

Western Kentucky University,
Applied Physics Institute

Research Mentor:

Dr. Phillip Womble

Career Goal:

Physics Professor

Home High School:

Bowling Green High School

Extracurricular Activities:

Violin, Boy Scouts, Tutoring,
Quiz Bowl

**Coolest Thing About
Summer Research:**

"Realizing that everything I learned in class this year can be incredibly useful."

"I'm enjoying putting all the computer programming skills I've learned to good use this summer. I knew nothing about programming coming in to the Academy. Now, I can use my skills to solve all sorts of previously impossible problems."

"Instead of taking a typical summer job just to earn money, I'm getting to start right away on my track to being a physicist. My internship isn't just a job or responsibility; it's the beginning of my career."

"No longer being the smartest kid at my school has certainly been a change at the Gatton Academy – but one much for the better. Seeing what my friends accomplish helps me realize all that's possible, even at 17."

- Ben





Logan Houchens
Crestwood, KY (Oldham County)

Research Topic:

Using Google Glass to Develop
an App for WKU

Research Area:

Computer Science

Research Location:

Western Kentucky University,
Department of Computer
Science

Research Mentor:

Dr. Uta Ziegler

Career Goal:

Computer Engineer,
Humanitarian

Home High School:

South Oldham High School

Extracurricular Activities:

Photography, Association for
Computing Machinery

**Coollest Thing About
Summer Research:**

*"Getting to develop and
explore hardware that is still
in its Beta stage while also
living on my own."*

*"The biggest challenge I had to
overcome in my research was its open-
endedness. I had always flourished in a
structured educational setting. But to
step outside of the classroom and learn
to face challenges with only a couple
tools really helped me as a student and
as a computer scientist."*

*"Out of everything I look forward to
next year, I am most looking forward
to forming meaningful relationships
with those in the incoming junior class.
I developed some of the best friendships
of my life this past year and I can't
wait to befriend, mentor, and love
those in the class below me."*



"What I love most about the Gatton Academy is the community. I consider everyone in the Gatton Academy part of my family, as I have come to accept their quirks, their fears, and the things that make them tick. I cannot imagine a place that develops stronger bonds between people than the Academy."

- Logan



Bradford Hull
Crestwood, KY (Oldham County)

Research Topic:

Molecular Interaction of Virus
Replicase Proteins

Research Area: Biology
(Predictive Antiviral Research)

Research Location:
University of Louisville,
Department of Microbiology
and Immunology

Research Mentor:
Dr. Donghoon Chung

Career Goal:
Anesthesiologist

Home High School:
South Oldham High School

Extracurricular Activities:
Club and School Soccer,
Guitar, Reading

**Where Would You Like To
Be In The Next Ten Years:**

*"I want to be an
anesthesiologist within the
next ten years. Hopefully, I
will be working in a hospital
doing what I love!"*

"On my first day of the Academy, I was terrified. As time progressed, I became more and more comfortable, until I eventually came to call the Academy home. The biggest change I have experienced in my first year at the Gatton Academy has been learning how to take care of myself. My parents did many things for me at home that I had to learn how to do on my own."

"What I love most about the Academy is all of the peers that are available almost 24/7 to help me with whatever work I may have. I am looking forward to being a Community Developer during my second year at the Academy. I cannot wait to decorate the wing and plan wing activities for my floor mates!"

"The biggest challenge of my research so far has been relearning all of the laboratory techniques that I first learned in the Genome Discovery and Exploration Program that I took the fall semester of my junior year. I use many of the techniques that I learned there in my research."

- Brad





Peter Kaminski
Owensboro, KY (Daviness County)

Research Topic:

Using Google Glass to Develop
an App for WKU

Research Area:

Computer Science

Research Location:

Western Kentucky University,
Department of Computer
Science

Research Mentor:

Dr. Uta Ziegler

Career Goal:

Air Force Officer - Cyberspace
Division, Computer Network
Security

Home High School:

Owensboro High School

Extracurricular Activities:

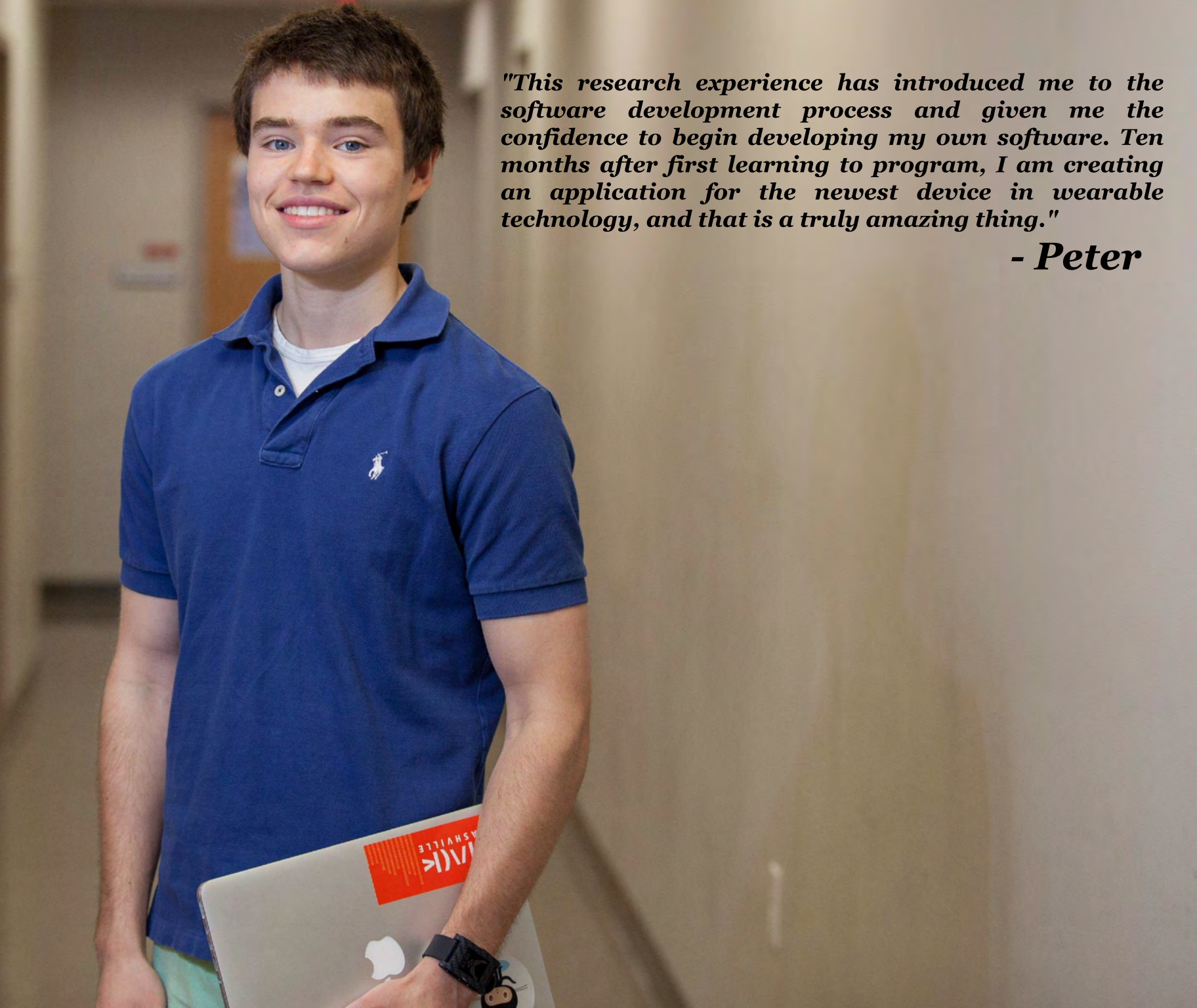
Eagle Scout, Tennis, Health &
Fitness Activities, Student
Government Association

Coollest Thing About**Summer Research:**

*"I received a grant to do
something I love for 8 weeks of
the summer."*

*"My biggest Gatton Academy accomplish-
ment was the paradigm shift I had when it
came to learning and mathematics. During
my junior year, I had Ms. Jane Brantley as a
professor. She got me to ask 'why' instead of
'how,' and that really changed my outlook on
learning. She taught me to appreciate the
beauty behind mathematics. Ms. Brantley
put me into the engineering mindset, a
mindset I probably wouldn't have
experienced had I stayed at home."*

*"My favorite part about the Gatton Academy
is that it exposes you to people, ideas, and
opportunities that would never be possible in
a typical high school setting. I had no idea
what computer science was before I came
here. Now, I can't imagine a future where I
am not working with computers and
developing software for them."*



"This research experience has introduced me to the software development process and given me the confidence to begin developing my own software. Ten months after first learning to program, I am creating an application for the newest device in wearable technology, and that is a truly amazing thing."

- Peter



Elizaveta Khenner
Bowling Green, KY (Warren County)

Research Topic: Enhancing the Biodegradation of Petroleum Hydrocarbons in a Fluidized-bed Bioreactor in a Novel Approach Using Immobilized Rhodococcus Actinobacteria

Research Area:
Biology/Microbiology

Research Location:
Perm State National Research University, Microbiology and Immunology Department (Russia)

Research Mentor:
Dr. Maria Kuyukina

Career Goal: Doctor

Home High School:
Bowling Green High School

Extracurricular Activities:
Beta Club, Med Club

Coollest Thing About Summer Research:

"Since I'm doing research in Russia, the coolest thing for me is seeing what research is like at a lab outside of the US. I think observing the differences between the US system and the Russian one is fascinating."

"Research is one of the most amazing things about the Academy. I was interested in biology for a long time before attending the Academy. Being immersed in research and working in a lab has shown me how diverse and complex biology can be. Researching in my chosen STEM field has only increased my knowledge and appreciation of biology. Now, my love for biology comes from a greater understanding."

"I love the people and the environment at the Gatton Academy. Everyone is extremely supportive and encouraging. If you're having a bad day, there will be someone to talk you through it and cheer you up. The students and the love and respect we have for each other make the Academy even more special."



"Even though I am fluent in both Russian and English, my biggest challenge this summer has been building up a scientific Russian vocabulary. It has been frustrating to struggle and say, "I don't know," when I don't have the vocabulary to communicate in Russian, but know the answer in English. However, reading scientific papers, asking for translations, and paying close attention to the vocabulary my mentor uses has helped me in overcoming this difficulty."

- Leeza



Paige Kington
Madisonville, KY (Hopkins County)

Research Topic:

Studying the Ability of Lunasin to Suppress Tumor Migration/Growth in the Model Organism Drosophila

Research Area:

Genetic Manipulation of Tumor Migration

Research Location:

Western Kentucky University, Department of Biology

Research Mentor:

Dr. Ajay Srivastava

Career Goal:

Cancer Researcher

Previous High School:

Evansville Day School

Extracurricular Activities:

Soccer, Volunteering at a Soup Kitchen

Coollest Thing About Summer Research:

"Being a part of a new, innovative research area."

"I learned who I was in my first year at the Gatton Academy. To me, that was the biggest change of my life: learning where my faults and best points are and where my inner interests are."

"I find that some of the deepest relationships are made on wing after midnight with a project due the next morning. Everyone in the Academy is incredibly open and welcoming to anyone and everyone."

"To me, research means that I have found an interest to pursue, be that a small question or a problem requiring months of investigation. Doing research this summer is a big problem with multifaceted questions that I hope to answer."

- Paige





Dimitri Leggas
Lexington, KY (Fayette County)

Research Topic: Calculation of Stationary Scattering States in 1D Problems

Research Area:
Computational Chemistry

Research Location: Western Kentucky University,
Department of Chemistry

Research Mentor:
Dr. Jeremy Maddox

Career Goal: Mathematician

Home High School:
Lafayette High School

Extracurricular Activities:
Running, Chess, Reading,
Pingpong

Coolest Thing About Summer Research:
"Thinking about a problem that doesn't have just one solution and trying to find the best one."

"For a young person interested in science and mathematics, research is a chance to discover. This discovery goes beyond contributions to science that first come to mind. It occurs on a personal level. Pondering new ideas is introspective. It's cathartic."

"The most difficult part of research is getting around setbacks, even small ones. They come up every day. Sometimes they arise because I am a student who is not an expert in the field, but other times they come up because no one knows the answer. Figuring out these issues provides a chance to read literature, ask questions, or just get my hands dirty writing code to solve the problem."



"My research project combines several of my interests: mathematics, chemistry, and physics. This internship is helping me to refine my passions so that I can begin to formulate my research goals in my professional career."

- Dimitri



Augustus Madsen
Cynthiana, KY (Harrison County)

Research Topic:

Synthesis and Characterization of Graphene Oxide Derived from Coal via an Improved Hummers Method

Research Area: Chemistry

Research Location:

Western Kentucky University,
Institute for Combustion
Science

Research Mentor:

Dr. Yan Cao

Career Goal: General

Manager of the Cincinnati
Reds

Home High School:

Harrison County High School

Extracurricular Activities:

Speech & Debate, Basketball,
Soccer, Fishing

Unusual Quirk About You:

"I can name every Best Picture winning movie dating back to 1927."

"I plan on using my research for applying to prestigious competitions such as the Siemens Competition and the Intel International Science and Engineering Fair. These contests are a great way to display my work and potentially receive scholarships."

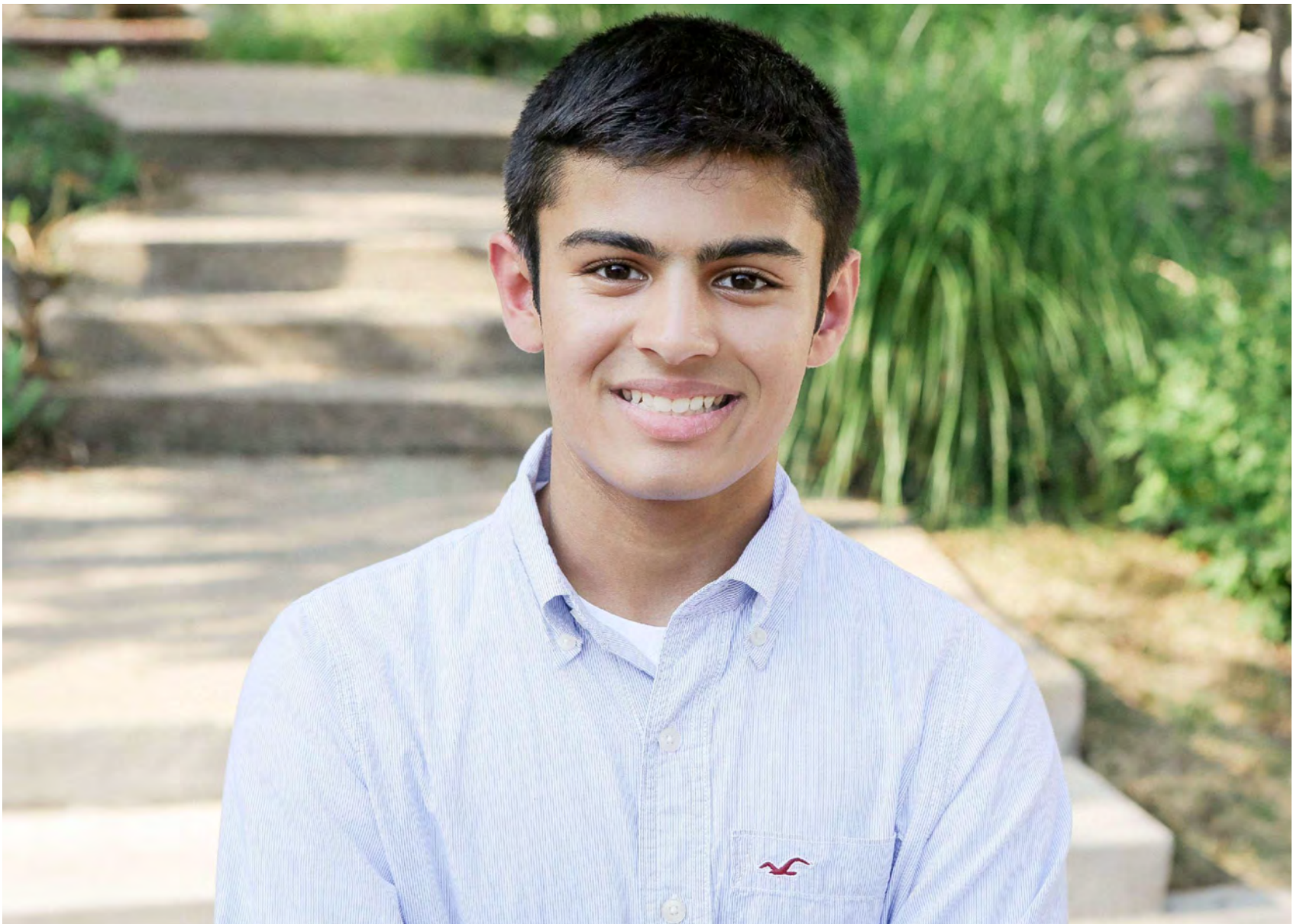
"What I love most about the Gatton Academy is the unconditional acceptance. There is no judging for the person you are or the one you hope to be. The biggest change I have discovered in my first year at the Academy is learning when to ask for help. I am convinced that these two years would be impossible without the support of others."



"The biggest challenge in my research has been working with people from different nationalities. At times it is difficult to communicate ideas, but I am slowly becoming accustomed to the change because teamwork is so vital in the lab."



-Gus



Vir Patel
Hopkinsville, KY (Christian County)

Research Topic:

Using Computational Biology to Trace Evolutionary Origins of Difference Classes of Human Disease Genes

Research Area:

Evolutionary Medicine

Research Location:

Vanderbilt University, Center for Human Genetics Research

Research Mentor:

Dr. Tony Capra

Career Goal: Medical Doctor

Home High School:

University Heights Academy

Extracurricular Activities:

Running, Tennis

Coollest Thing About**Summer Research:**

"Knowing that I'm doing something that's never been done before."

"I love the sense of family that I see in everyone at the Academy, both staff and students. This has made my Academy experience exceptional, and I wouldn't trade it for anything."

"On my first day at the Gatton Academy, I was scared of what the next two years would bring. A year later, I am still scared of what will happen next year. But, like on my first day, I look forward to the future of my stay at the Academy. I look forward to the same experience that I had my first year... time with friends, awesome research, and memories I'll never forget."

"As one interested in medicine, I wish to learn more about diseases and their origins. I believe that many elusive disease cures lie in the origins of these diseases, and this internship allows me to investigate my interest."

- Vir





Ananya Sharma
Bowling Green, KY (Warren County)

Research Topic: Studying
How Silver Nanoparticles are
Taken Up by Various Tissues in
the Model Organism
Drosophila

Research Area:
Biology/Nanotoxicology

Research Location:
Western Kentucky University,
Department of Biology

Research Mentor:
Dr. Ajay Srivastava

Career Goal: Cardiologist

Home High School:
Bowling Green High School

Extracurricular Activities:
Dance, Music

**Coollest Thing About
Summer Research:**

*"I am using silver
nanoparticles that emit a blue
floreescence."*

Unusual Quirk About You:
*"Sometimes when having a
conversation, I'll accidentally
say something in Hindi."*

*"The biggest change that I have
experienced in my first year at the Gatton
Academy is the level of independence that
we are given coupled with our
responsibilities. It's finding the balance
between both that allows us to succeed."*

*"During my summer experience, I am
most looking forward to observing
nanoparticle localized areas in *Drosophila*
(fruit fly) larvae under a fluorescent
microscope and then dissecting those
areas. The dissections are the biggest
challenge of my research. The larvae must
be dissected with extreme precision under
a stereomicroscope due to their miniscule
size."*

"In the next ten years, I aspire to specialize as a cardiologist after completing medical school and residency. "

- Ananya





William Walters
Lexington, KY (Fayette County)

Research Topic:

Mining Twitter for Data to Study Neurological Actions of Informal Internet Lexicon

Research Area:

Computer Science and Psychology

Research Location:

Western Kentucky University,
Department of Psychological Sciences

Research Mentor:

Dr. Lance Hahn

Home High School:

Paul Laurence Dunbar High School

Extracurricular Activities:

Academic Team, Playing Piano

Favorite Thing About the Gatton Academy:

"It's a place where I feel like I can exist comfortably. At Gatton, it's almost like I'm filling a role that exists just for me."

"In my second year at the Academy, I am very excited to take on the role of Community Developer. I'm excited to be able to actively contribute to the Academy and to lead the way by thinking of new activities."

"This summer I am experiencing the challenge of living on my own. At the Gatton Academy, I was living away from my parents, but I was still on a hall and under supervision from the Gatton staff. This summer, I am discovering how well I can cope moving from that to even greater independence."



Jack Wassom
Bowling Green, KY (Warren County)

Research Topic:

Using the Micro-EDM to Study
Aerospace Materials

Research Area:

Advanced Manufacturing

Research Location:

Western Kentucky University,
Department of Architecture
and Manufacturing Sciences

Research Mentor:

Dr. Muhammad Jahan

Career Goal:

Engineering, Nanotechnology,
Entrepreneurship

Home High School:

Greenwood High School

Extracurricular Activities:

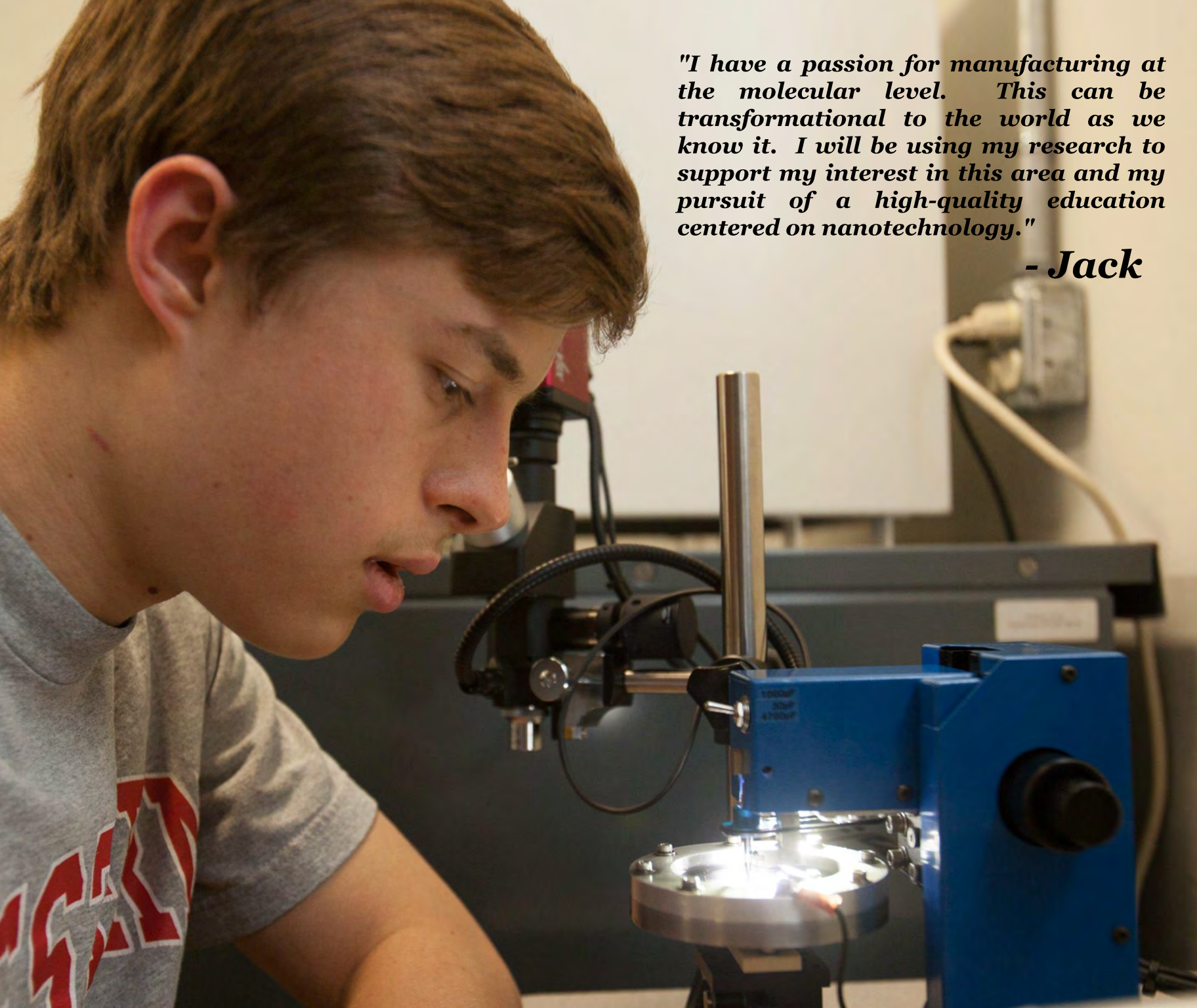
Running, Guitar, Tinkering

**Coollest Thing About
Summer Research:**

*"I'm learning how to use a
bunch of cool and expensive
tools."*

"This summer's research fits into my educational goals because it gets my feet wet in my field of interest while giving me experiences that may assist in gaining access to potential schools, jobs, and internships down the road. Writing a research paper, submitting it to journals, and training on some of the tools that are used in my field all add to my resume."

"What I love most about the Gatton Academy is that it allows students to pursue academic excellence while being in a supportive community. This community is not only like-minded in its academic focus, but they are also a network of friends who are always right outside my bedroom door."



"I have a passion for manufacturing at the molecular level. This can be transformational to the world as we know it. I will be using my research to support my interest in this area and my pursuit of a high-quality education centered on nanotechnology."

- Jack

CAROL MARTIN GATTON
ACADEMY OF MATHEMATICS & SCIENCE IN KENTUCKY





Plant	Total Length cm	Leaf length mm	Notes
I1	107.7	35.6	
I2	81.5	25.4	
I3	74.5	18.5	
I4			
II1	78.0	22.2	
II2	80.9	20.6	
II3			
II4			
III1			
III2			
III3			

Notes:
 - I1: ...
 - I2: ...
 - I3: ...
 - II1: ...
 - II2: ...
 - II3: ...
 - II4: ...
 - III1: ...
 - III2: ...
 - III3: ...