

Science In Action!

Annual Report (2017-18)
Program Manager: Dr. Rohan Kundargi



“ My favorite part of SIA! is getting to the classroom and when the students see us in the door carrying in their supplies for the lesson.

When we walk in, all eyes are on us and you can see their faces light up! ”

Alyssa Cottrell (*Biology, '20*)

Fall 2017 SIA! Volunteer

MESSAGE FROM THE DIRECTOR

When I started helping with science education at my daughter's elementary school many years ago, I noticed something profound. It happened not in the classroom but on the playground before school one day. A child I barely knew rushed up to me with a big smile on his face yelling: "Nancy!!! Nancy!!! Do we get to do science today?" That's when the proverbial light bulb lit up in my brain—this is the attitude all children COULD have. Imagine that—all students coming to school hungry for science. Right there on the playground I realized I could reach many more students by involving Gonzaga undergraduates in science outreach.

This was the catalyst for Gonzaga's science education outreach program, *Science in Action!*

On my sabbatical year 2006-2007 I tested science activities at Roosevelt Elementary school. The next year I launched *Science in Action!* with just a few students working with 4-6 classrooms; sending teams of Gonzaga University undergraduates to K-6 classrooms for eight weeks each semester to do hands-on, guided inquiry activities. The program now sends over 70 Gonzaga students each semester to more than 20 K-6 classrooms and after-school programs; it has sent 750+ students into 275+ classrooms since that first session in 2006. The GU students are trained in weekly workshops and bring the necessary supplies with them to their classroom later in the week. The K-6 students love having Gonzaga students in their classroom and our GU students find it rewarding to share their love of science and teaching.

The goals of *Science in Action!* are to:

- 1) Cultivate K-6 student curiosity, knowledge in science and overall scientific literacy.
- 2) Recruit science majors into the teaching field.
- 3) Help pre-service teachers develop confidence in their abilities to teach science by providing them with a
 - a) Tool kit of science exercises and activities
 - b) Real world setting to test teaching strategies that will help them into their future classrooms.
- 4) Provide additional resources to our partner teachers and schools to help teach science all the time!

We envision that all students, no matter their background, will be truly engaged in science early on in their education.

We envision a world in which everyone understands that science is a way of thinking, a strategy to figure out how something works (whether it is a machine or a muscle fiber), and that science is what, in the end, will enable us to make our world a better place.

We live in a technology-based society full of complicated challenges. Who will usher in the next era of antibiotics, solve our food production and water issues in a changing climate, and solve our growing energy needs? What we need are diverse brains from diverse backgrounds that have grown up with large helpings of science education. *Science in Action!* attempts to build this foundation in our community.



(Above) Dr. Staub's daughter engineers a tower with just paper supports during SIA!

Professor Nancy Staub
Science In Action! Director

To promote enthusiasm of STEM (Science, Technology, Engineering, and Mathematics) subjects and scientific literacy, Gonzaga's *Science In Action!* (SIA!) has designed novel outreach programming this year for K-12 students, educators, and the general public.

Celebrating its 11th year of science outreach to the Spokane community, SIA! produced, facilitated and supported over a dozen different programs, workshops, and events; with over 2,000 students, teachers, and citizens impacted via our initiatives this year.

Science Education Programs

Science In Action! - In The Classroom (ITC) & After School (AS)

Gonzaga's longest running science outreach program, SIA! sent over 134 undergrads into 36 Spokane classrooms & after school clubs, to lead 288 hands-on, inquiry based activities. The after school program was piloted S18 and will be expanded into other SPS Express Afterschool programs.

Bringing Research Into Classrooms (BRIC)

With BRIC, *Science In Action!* hopes to lay down a strong foundation of scientific enthusiasm by bringing current scientific research topics into classrooms. SIA! has partnered with several Gonzaga faculty and researchers to adapt active research projects and focuses into hands-on lessons. This year, SIA! partnered with research groups to create activities about 'Arachnid Biodiversity' (Dr. Steven Schwartz) and 'Invasion Biology' (Dr. Betsy Bancroft). This winter, SIA! will partner with an Antarctic research expedition to create a set of NGSS-aligned activities.

Science In The Summer!

Science In Action! runs several science outreach programs and workshops on the Gonzaga campus during summer sessions:

- Last June, SIA! and the Biology department hosted the WSU Na-Ha-Shnee Summer Institute and led a multi-day bacteriophage lab experience for 20 Native American high school students from around the country. The Na-Ha-Shnee Institute will be visiting again this summer at the end of June.
- SIA! coordinates placements & logistics for many high school student researchers working within GU faculty research laboratories.



(Above) An inquisitive group of students listen to Scott Griffith (NGTB Coordinator) demonstrate how 3D printers work during SIA!'s open house at the Salish School of Spokane.

Community Outreach Programs

STEM Outreach Events

School STEM/Science Fairs – *Science In Action!* participated in 5 school science/STEM fairs, with activities ranging from oobleck to bottle rockets. *SIA!* also partnered with Dr. Kevin Measor & Spokane Center for Public Neuroscience Education for two of those events.

Eclipsed by Science! – Outreach event celebrating the August 2017 solar eclipse. Held on the Hemmingson Roof Garden in partnership with the Next Gen Tech Bar. Physics Professors Nicole Moore & Matt Geske presented hands on displays about their research.

Eastern Washington Regional Science & Engineering Fair

The 2nd annual EWRSEF, held on the WSU-Spokane campus, hosted over 200 projects and awarded over \$10,000 to students. Dr. Kundargi represented GU on the event's planning committee and scholarship chair and several GU faculty served as judges.

STEM Educator Professional Development

Geology of Spokane Workshop – For the second year, *SIA!* led a 2 day workshop with pre-service teachers within the School of Education on how to incorporate Earth Science into K-12 classrooms. *SIA!* partnered with local a geoscientist and teacher, Jamie Kendall, to lead a field trip around Spokane emphasizing the importance of place-based learning.

The Scientist Within: See below.



(Above) Dr. Kundargi helps a scientist model a composite volcano using a film canister and plastic wrap.

Pipeline Programs

The Scientist Within: Phage Hunters

An intensive, two-week long, professional development workshop designed to immerse high school science teachers into the hands-on research science process. This program will be funded via the Murdock Foundation and aims to be self-sustaining by 2023.

SIA Faculty Science Fair

This Fall, *Science In Action!* will be hosting a Faculty Science Fair where 15-20 Gonzaga faculty & researchers will showcase their personal research projects via tri-fold poster presentations. Partnering with the Spokane Public School Department of Career & College Readiness, 5th/6th graders from several schools around the district will be bused in for this event.

BRIC in Antarctica:

SIA! is partnering with Dr Jen Lamp of the Lamont Doherty Earth Observatory to write NGSS aligned curriculum for Dr. Lamp's forthcoming (NSF-funded) field work in Antarctica this winter! Lessons will be utilized during the Spring and Fall 2019 *SIA!* sessions.

Support & Staff

Science In Action! would not be possible without the support of the: Biology and Chemistry & Biochemistry Departments at Gonzaga University, Howard Hughes Medical Institute through the Undergraduate Science Education Program, George Luger, Avista Foundation, Hollister-Stier, Rotary Club 21, Robert and Claire McDonald Work-Award Program, Washington STEM, and Itron. The photographs used in this report were taken by Zack Berlat (GU Photography) unless otherwise noted.

Day to day operations of *Science In Action!* are managed by Dr. Rohan Kundargi (Science Outreach Coordinator) and a staff of 5 student employees who are funded via the McDonald Work-Award Program, Federal Work Study, & Gonzaga University.



Photo by Gonzaga SIA!

“ This was definitely an outlet that made it easier to be involved in the greater Spokane community than I had expected.

The kids were great - from their initial excitement seeing the materials to their growing fascination as the material was really sinking in was super fun to watch...

Now coming away from this semester, I'm sad saying goodbye to all of them, but it was a very fun experience for me and I'm happy my service-learning class made me get involved. ”

- *Science In Action!* Undergrad Volunteer (S18)

Young scientists at work at Cooper Elementary (left) and the Salish School of Spokane (below).

Student Testimonials

“ One of the most memorable moments for me was after our second lesson, when one of the girls in the class said she wanted to grow up and become a Gonzaga scientist.

It makes me so happy to think that we impacted the kids in such a big way. ”

- *Science In Action!* Undergrad Volunteer (F17)

“ SIA! reminds me why I want to be a teacher, as well as the importance of getting excited about STEM.

Kids are so willing to love STEM, we just need to expose them to it in an energized way that promotes curiosity. ”

- *Science In Action!* Undergrad Volunteer (S18)



“The kids loved it! They were cheering, and saying things like

I love Science!

So, big success.”

Trisha Blalack
3rd Grade Teacher at Grant Elem.
SIA! Teacher Partner

(Right) Senior Kayla Gunther (*Biology, '18*) teaches future entomologists about arachnid biodiversity.



Photo by Gonzaga SIA!

Teacher Testimonials



Photo provided by Salish School of Spokane

“At conferences, one parent told me that Fridays were her daughters favorite day because she loved Science in Action!

This parent also loved that the leaders were girls...someone her daughter could look up to with the interest of science.”

Tiffany Santos
3rd Grade Teacher at Westview Elem.
SIA! Teacher Partner

(Left) Senior Ashley Beausoleil (*Biology, '18*) helps a young scientist operate a microscope.

Science In Action! - In The Classroom

By The Numbers

2017-18

134

GU Students

Lead

288

STEM Activities

Reaching

800+

K-6 Students

Contributing

2,680

Hours of Service
to the Community

2007 - Present

900+

2,750+

7,500+

17,700+



“At first, it can be tough.

You're going into an environment that you haven't been in for about 9-12 years...

and it can be overwhelming.

That being said....

Science In Action! has given me... a unique insight into the life of a teacher and has given me appreciation for what education looks like for kids who may be in a low SES neighborhood.

It's been a truly beneficial experience, and one that I really wish I had started earlier.” – Alexander Kures (*Biology*, '18)