



Islandbots Robotics

By Alexander Kirillov, Team coach, Math teacher

This year is the 9th season for Islandbots Robotics Club, created by SchoolNova teachers Alexander Kirillov and Corina Mata. Our team members graduate and leave the club, new students take their place - but the fun continues: as before, we meet every week in the basement of one of the team members to build the robot for the First Tech Challenge (FTC) competition, a robotics competition for middle and high school students. This year, there are over 4500 teams worldwide participating in FTC; the competitions start at local qualifiers and culminate in FTC World Championship in end of April.

This year, the challenge is to build robots capable of shooting the balls into the goal raised high above the field, find and press buttons on the color beacon, and raise a large ball on top of the goal. It is slightly different from the past years - but as before, it requires many skills: designing reliable mechanisms, programming autonomous movements using sensors, driving the robot in teleop mode. You need to use 3d printers and power tools, test different designs for ball shooter and learn how to use orientation sensor.

So far, team Islandbots, after getting some awards in the Long Island regional competition, went to NYC Championship, where we took the top spot, becoming the captain of the winning alliance - the first for us!



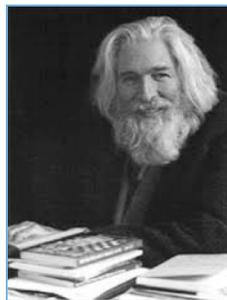
This allowed us to advance to East SuperRegional competition, which took place in Scranton, PA on March 17-19. It was an exciting competition - you can see one of our matches on YouTube (search YouTube for Islandbots).

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Remembering Raymond Smullyan

By Alexander Kirillov, Math teacher

Raymond Smullyan, mathematician and author of many popular books of logic puzzles, died on Feb 6, 2017 at the age of 97.



Smullyan wore many hats. He was a mathematician who made important contributions to mathematical logic, in particular to the extensions of Godel's incompleteness theorem, and had published a number of academic articles and books, including some very popular logic textbooks; he was a professor at CUNY Graduate Center and University of Indiana.

He was also interested in eastern philosophy, having published several books on Taoist philosophy, and an amateur astronomer. He loved magic tricks, and in some moment in his life, he actually made his living performing magic tricks on stage. Above all, he loved logic puzzles - and used them everywhere, including his first date with his future wife (the only way to solve the puzzle he offered her was by kissing him). As you can see, logic can be useful in real life.

But what he will be mostly remembered for is his logic puzzles books. Smullyan was one of the greatest writers of popular math books of our time, next to Martin Gardner.

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Enjoyable and Inspiring Math: SchoolNova's First Math Festival

By Elena Yakubovskaya, Math Teacher

Over the years of development of the SchoolNova mathematics program, instructors of all grades have been facing the same challenge -- there are way more activities and topics than we have time for in our lessons. We recognize that what students often need is a setting where, under minimal guidance, they can take their time to make their own discoveries.

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For many people, including professional mathematicians, their love of math began with his books. Even those who do not remember Raymond Smullyan’s name must be familiar with his work.

Have you ever seen logic puzzles about the island of Knights and Knaves? They were introduced by Smullyan, in his book of logic puzzles “*What Is the Name of This Book?*” I remember how we argued about some of the problems in that book when I was in 8th grade, and I still keep a much-used Russian translation copy of this book from that time.

Or maybe you remember some of the stories about the choosing the right room to find the princess - if behind some of the doors there is a tiger? This is Smullyan, too - his book “*The Lady or the Tiger*”.

Or if you are in the mood for something more challenging, how about “*The Gödelian Puzzle Book: Puzzles, Paradoxes and Proofs*”, which leads you to the proof of one of cornerstones of modern mathematical logic, Godel’s incompleteness theorem - all in the form of logic puzzles?

And this is not all - there are also “*Alice in Puzzle-Land*” and “*Satan, Cantor, & Infinity*”, “*Mixed Bag*” and “*The Riddle of Scheherazade*”, and more...

Or have you seen this Smullyan’s puzzle, called by his colleague George Bolos “the hardest logic puzzle ever”?

Three gods A, B, and C are called, in some order, True, False, and Random. True always speaks truly, False always speaks falsely, but whether Random speaks truly or falsely is a completely random matter. Your task is to determine the identities of A, B, and C by asking three yes-no questions; each question must be put to exactly one god. The gods understand English, but will answer all questions in their own language, in which the words for “yes” and “no” are “da” and “ja,” in some order. You do not know which word means which.

If not, try solving it. Let it be your tribute to the great logician.

RIP, Professor Smullyan.

How Can I Help SchoolNova?

SchoolNova at Stony Brook is a nonprofit 501(c)(3) tax-exempt organization and is qualified to receive tax-deductible bequests, devises, transfers or gifts. Contributions from individuals, foundations and corporations are welcome. You can donate through the PayPal Giving Fund (no fee), using PayPal Donate Button (fee is charged), by sending us a check or through Fidelity Investments. (School’s account # Z47924238).

If you would like to make a charitable donation to the Russian Theater studio “Dragonfly” or to Islandbots Robotics team, please, specify by writing us an email info@schoolnova.org

On Time

By Anya Cartwright, Art Teacher

Have you ever imagined the passage of time as a wire, spiraling upwards, repeating the curves of familiar cycles, and yet gaining new levels with every turn? Or the threads of timelines intricately tied together in a macramé, displaying the delicate balance of life events and their interconnections on the path of time?

Or, how about a sailboat – the symbolic vessel of life – powered by the winds of time on its journey?

Or, perhaps, you could visualize the time segments branching out from the larger limbs until they fragment into moments on the big tree of time.

These and many other conceptual ideas belong to our SchoolNova art students. All of them resulted in creation of unique 3D designs in the project evolving around the idea of a Calendar. Historically, the human need to make the time passage measurable and the time periods countable and organized into a system led to what we know today as a calendar. In the heart of the project was the insight into the history and science of human quest to record and predict the passage of time. To our delight, we made an amazing discovery: not only that our children have unique perceptions of the concept of time, they were also able to visualize and materialize them into sculptures, contrivances and even mechanisms with the merit of aesthetics. Even the carefully selected materials often had their symbolic meanings: the driftwood – seasoned by tides and time; or sand - being the symbol of time measure by the hourglass, or the twine – symbolizing the continuation.

Seeing is believing. We proudly displayed the project in our annual Winter Art exhibit, provoking a lasting conversation among some. We hope to bring the artwork back on display in the spring, in our traditional End of the Year Exhibit for those who missed it.



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American Math Contest

By Alexander Kirillov, Math Teacher

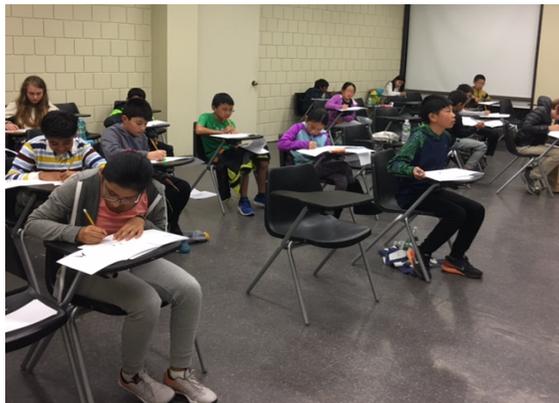
American Mathematics Competitions is the oldest (began in 1950) and most prestigious mathematics competition for high schools and middle schools in the US. SchoolNova participates in the competition since 2005.

This year, SchoolNova once again held the American Math Contest (AMC) competition in collaboration with Stony Brook University Department of Mathematics. AMC 8 was given in November, and AMC 10/12B was offered on Feb 15, 2017. Each competition was attended by about 35 students, about half of them from SchoolNova. Latter contest is the first level of nationwide mathematical Olympiads, organized by the Mathematical Association of America; more than 300,000 students take it annually.

Nine students who got the best results in AMC 10/12B qualified for the next level, American Invitational Mathematics Examination (AIME) – this is our best result so far! SchoolNova will offer AIME II on March 22, and the best students from AIME will go on to USA Math Olympiad. Test yourself – how many problems of the past AIME competitions can you do?

https://artofproblemsolving.com/wiki/index.php/2017_AIME_I_Problems

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Advanced Math Problem Solving Club in SchoolNova

By Alexander Abanov, Math Teacher

There are four math clubs for students of various ages functioning in SchoolNova this academic year. The “Advanced Math Problem Solving Club” for high school students (grades 8-12) opened this year by Alexander Kirillov. This club is designed as a math circle and is open for students who enjoy solving challenging math problems. Unlike other classes and clubs it is also open for students who are not registered as SchoolNova students.

The tradition of math circles goes back to about one hundred years ago. The first math circles most likely appeared in Bulgaria and Russia in the nineteen twenties and thirties. They started to get popular in the US about 10-15 years ago.

There are math clubs of various styles. The one in SchoolNova is focused on solving and discussing problems from various math Olympiads and competitions as well as on discussing math topics that are especially useful in solving such problems. Some of the club meetings host faculty and students from Stony Brook University's Math Department, many of who are former participants in the International Math Olympiad. The topics discussed this year so far included the pigeonhole principle, number theory, method of invariants, and graph theory. The students participated in the online MathMadness competition and formed two teams that traveled to Boston to compete in the prestigious Harvard-MIT Math Tournament.

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Physics Bowl 2017 at SchoolNova

The 2017 exam will be given between March 29 and April 14, 2017.
Division I is for first-year physics students and Division II is for second-year physics students.

<http://www.compadre.org/psrc/items/detail.cfm?ID=391>

Read. Be Inspired. Write back.

By Kara Palumbo, Advanced English teacher

SchoolNova's Advanced English allows students to write and study literature outside the standard curriculum they are used to. Students learn the art of literary analysis while being able to express their thoughts and opinions on a chosen text. Whether or not a child is going to pursue something in the Arts or the Sciences, they will need to develop their analytical skills. Students are required to write in a variety of styles in order to demonstrate their understanding of the literary curriculum. Furthermore, every year students are asked to submit their writing to competitions, such as The Scholastic Arts & Writing Awards and The Library of Congress National Reading-Writing Promotion Program.

I tell my students that, even if they are going to study bioengineering, they will need to know how to use various forms of writing and rhetoric. Advanced English consists of two levels, Advanced English A and Advanced English B. Students from grades 5-7 are placed in section A and grades 8-10 are placed in section B. Lessons are constructed to reach multiple levels of learning; this aims to strengthen and challenge all students. The freedom and flexibility of SchoolNova's curriculum allows me to alter lessons to meet my students' needs. If I assign a writing assignment and see that the class is struggling with figurative language or grammar, I can structure my next lesson to help with such issues. I begin each semester by asking the students to write me a private note with their ELA concerns. This gives me an idea of what will benefit the class as a whole. Advanced English is not only for the advanced student; it is for the students that want to advance.

This year's Advanced English classes have been busy writing since the onset of the semester, and their hard work has paid off. Every student participated in a writing competition. Advanced English A competed in the Library of Congress National Reading-Writing Contest, *Letters About Literature*. Each student wrote a letter to an author discussing how their work personally affected them.

For this competition, students learned how to apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts. Advanced English B competed in the Scholastic Art & Writing Awards. Students wrote for a specific category (short story, poetry, flash fiction, critical essay, or, journalism). Judges looked for a "work that exemplified originality, technical skills, and the emergence of personal voice or vision" (artandwriting.org/what-we-do/the-awards/categories/).

SchoolNova's very own Priya Mukhi received the Golden Key Award for her poem, "Grandmother's Diary." The Golden Key is the highest award that a student can receive. Her work will be automatically considered for national-level recognition.

GRANDMOTHER'S DIARY

By Priya Mukhi

1

I am welcomed by the musty smell of her attic,
Where light peeks through the half covered window and
Quirky little artifacts from the 50's sit proudly on the shelves.

I am hesitant to begin, for I am afraid.
Afraid that I will ruin her memory if I touch anything.
Mom's voice rings through the house,
"Honey, need any help up there?"

"No Mom, everything's fine up here. Thanks!"
Sighing, I dare myself to touch her belongings.

(1st stanza)

By A. Abanov Continued from page 3

Math club participants performed well at the AMC 10/12 national competitions with 3 students qualifying for the next level AIME competition. One of these students has already taken AIME I; while no official announcement has been made, it is likely that he will be advancing to the next step: USA Math Olympiad (USAMO).

Our math club is not just about solving problems. It is about enjoying math, team spirit and, of course, pizza! We are looking forward to future competitions, challenging and interesting problems, and to new talents. If you are interested in participating in the club or supporting it, please, let us know.

One of the simple but fun problems discussed at the club:

A climber is at the top of an almost vertical rock of the height 100 m. There is a tree growing on the top of the rock and another one on the rock at the height 50 m. The climber has a rope of the total length 75 m and a knife to cut the rope if necessary. How can he get down from the rock?



By E. Yakubovskaya, continued from page 1

This often works best through math experiments and games, which we have extremely limited time for. In the past few years, we began to fill in this gap by introducing Math clubs for all age categories. Math clubs give students an opportunity to prepare for Olympiads, play games, and explore side-topics in math in a more relaxed environment.

One of the greatest ways for students to experience the diversity of Math games, puzzles, building kits, and workshops in a free-form exploration format is a Math Festival. Such festivals have had a great success in inspiring students to see math in new ways, attend workshops, and share the excitement with their friends. The largest such festival in the US is the National Math Festival. It will take place on Saturday, April 22, 2017 at the heart of downtown Washington, D.C.

This year, we are happy to announce SchoolNova's First Math Festival. Through it we hope to bring the Math Festival culture of discovery to Stony Brook with our own unique spin enabled by years of experience in teaching Math enrichment to school students.

At the Festival, you will be able to:

- Discover a great variety of fun games, many of which you have probably never seen before, that inspire mathematical thinking and develop math skills. We will choose more than 20 of our favorite board games for all ages and will show you how to play them. We are sure that some of them will become your family favorites for years to come!
- Experiment with math demonstrations that we have developed ourselves; mirror symmetries, geometrical projections, fractals, optical illusions, tessellation, etc.
- Participate in workshops on various topics that you will probably not see in school, such as linguistics, knots, topology, strategy games, Mayan numbers and many others.
- Talk to organizers and instructors to help you continue hands-on Math explorations at home.
- Play with a variety of constructor kits, from peas and sticks to magnetic blocks and Zome.

We believe in the importance of self-motivated exploration: An independent discovery of a concept can turn out to be more meaningful than weeks of classes. We hope that students (and parents, too!) will come to wander around freely and stop at the stations that are most exciting to them. You may choose to go to every station for a little bit, or get stuck at a single one for an entire hour until you've figured out the conceptual mystery that was keeping you intrigued.

The SchoolNova Math Festival will take place on Sunday, April 30 at School Nova. The admissions are free for everyone, including those who do not attend SchoolNova classes. Stay tuned for more information on the SchoolNova website.



The National Math Festival brings together some of the most influential mathematicians of our time to inspire and challenge participants to see math in new and exciting ways. Through a day of lectures, hands-on demonstrations, art, films, performances, puzzles, games, children's book readings, and more, we bring out unexpected sides of mathematics for everyone, from toddlers to adults of all ages.

The National Math Festival is free and open to the public from 10:00 a.m. till 7:00 p.m. on Saturday, April 22, 2017 at the Walter E. Washington Convention Center in the heart of downtown Washington, D.C.

Opportunity to advance

By Lisa Braverman, parent

Study at SchoolNova has provided an invaluable opportunity for my son David to advance his intellectual, social and emotional development. We are most grateful to SchoolNova's Director and wonderful teachers for all the interesting and informative classes that they have offered for my son.

Early on, when he was younger, he had reached a crossroads in terms of the enrichment programs that were available to us on Long Island. He had outgrown the programs that he was attending and was very eager to study physics in an intensive way so that he could understand the subject in greater depth.

It was when the parent of a student at the SUNY Old Westbury Institute for Creativity Problem Solving and Math mentioned an intensive experience that her son had participated in for many years. She praised an academic enrichment program called SchoolNova and attributed much of her son's academic development to the program.

I immediately wrote Marina Polonskaia, asking about admissions, eligibility, tuition, teachers, etc. We were delighted to find that David would be accepted to study physics, math, and computer science, all able to be studied conveniently during the weekend.

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The mission of SchoolNova – to provide an environment where children can find nurturing, cultivation and support--is unique on Long Island. Its excellent teachers are a group mostly of Russian-born educators with specialties in languages, science, math, technology, art and other topics. Many are professors at SUNY Stony Brook and some are scientists at Brookhaven National Laboratory. All are devoted to teaching and enriching the intellectual and individual talents and capabilities of children.

As an educator, I am extremely impressed by the obvious dedication and hard work that the School Nova teachers contribute. They give up a weekend day to come to work and passionately cultivate and teach our kids. During summers, they also spend a week in at SigmaCamp, where children may become immersed in science, math, learning and the natural world with SchoolNova teachers and other invited scholars and professors. My son has attended the camp two years in a row and really has enjoyed it, made new friends and grown closer to his teachers.

I have watched my son deeply develop his math and physics skills and benefit from his SchoolNova lessons. He feels these days that the math in his high school is not true math and refers to his SchoolNova classes as the "real" math.

The teachers, in turn, have supported my son by offering help with his school projects and with written recommendations for his applications to competitive programs, awards competitions, etc. I really know that they care about my son.

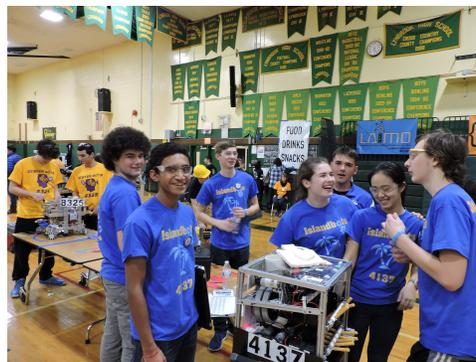
He has studied a total of four years at SchoolNova, and has graduated. Still, he wanted to come back to study, and so is currently studying a fourth year of physics and also has joined the Advanced Problem Solving Math Club. This new initiative, taught by Drs. Kirillov and Abanov, full-time faculty members in the Stony Brook Math and Physics Departments, has helped students understand advanced approaches for solving complex mathematical problems. They also traveled to participate in the Harvard-MIT Math Tournament last year. . My son relays that this club has deepened his ability to do advanced problem solving, proofs, and to learn college-level topics.

If he could continue to study at SchoolNova, he would. I've never had to push him; he has always wanted to come to class. That's how important and enjoyable School Nova has been to my son.

This is a truly unique program with devoted teachers all working to the same goal of enriching children's lives and minds. The Long Island community is very fortunate to have such a program available to families. SchoolNova has become like a close-knit family for us where teachers don't only teach, they also care about our kids. I feel very fortunate that my son has had this experience and feel that it has been extremely formative for him and his future.

Thank you, SchoolNova!

We are now actively preparing for the World Championship - improving the robot, polishing our presentation, arranging the hotel and plane tickets, and fundraising. Travel to St. Louis is expensive, so we need sponsors to be able to attend. You can help us achieve our dream by donating online at <http://tinyurl.com/islandbots2017>



Wish us luck! Follow our team at www.facebook.com/islandbots/ and [instagram.com/islandbots4137/](https://www.instagram.com/islandbots4137/)

Students are welcome to the following events hosted by Stony Brook University:

- Public lectures at the Simons Center for Geometry and Physics are given by leading scientists coming to the campus. The lectures are announced on the Center's web site <http://www.scgp.stonybrook.edu/> and also by posters. In particular, public lectures in the Della Pietra lecture series are described on the Center's web site: <http://scgp.stonybrook.edu/scientific/public-lectures/della-pietra-lecture-series>. The next public lecture will be given at the end of May 2017 by Sir Christopher Llewellyn Smith – the former CERN director.
- Lectures on Astronomy, Physics, Geosciences, Ecology and Evolution are given almost every Friday night during school year. These lectures are targeted to the general audience and are given by faculty of the University on topics related to their research. Schedules and information can be found at: <http://www.physics.sunysb.edu/Physics/WorldsOfPhysics/2016/2017/>
- SchoolNova is hosting several national math, physics, and language competitions. Links to these and other activities recommended by SchoolNova can be found on the SchoolNova web page: <http://schoolnova.org/nova/activities>

Cultural Activities at SchoolNova

By Anzhelina Shtenger

Everyone knows how much SchoolNova values the sciences, including mathematics. However many people don't realize how much SchoolNova values its cultural diversity. In addition to various events and classes we hold in the sciences, SchoolNova has two multicultural events.

Every year for the past 13 years, SchoolNova hosts its Holiday Party in the beginning of January. We celebrate the winter holidays with a celebration that is fun for all! Parents bring home-made delicious food that is native to many different parts of the world. The night is filled with lots of dancing, eating, games, and a theater performance by the Russian theater studio Dragonfly. This event is open to all the SchoolNova community, and families even bring their friends that don't attend SchoolNova to join the fun festivities!



Almost since the very opening of the school, SchoolNova has hosted a Spring Concert every spring celebrating Foreign Languages. We teach Russian, Spanish, and French and many students starting from the age of 5 take advantage of these classes and try to learn another language!

The students of these classes prepare songs or skits to perform In front of their parents and the

whole SchoolNova community.

They show everyone how far they've come and their new foreign language abilities.

Like us on Facebook!

<https://www.facebook.com/schoolnova>

By A. Cartwright, Art teacher, continued from page 2

It's not a coincidence that the calendar project landed itself in our art program. Creating a calendar system combines the scientific and historic inquiries with ingenuity, conceptual thinking and aesthetic appreciation.



This is an example of our multidisciplinary approach in compiling the Art Program – the integration of much intelligence propelled by creativity. The goal is to trigger the curiosity to see beyond what's in front of us, find many paths and connections, uncover new questions to which to seek answers to and send the acquired knowledge storming into the imagination.



Thank you for your support!

We would like to thank everyone who was generous enough to donate time, money and corporate stocks to SchoolNova! We sincerely appreciate your support and help!

Special thanks to the Simons Center for Geometry and Physics and to the Departments of Physics & Astronomy and Mathematics for providing space for SchoolNova's competitions and special events.