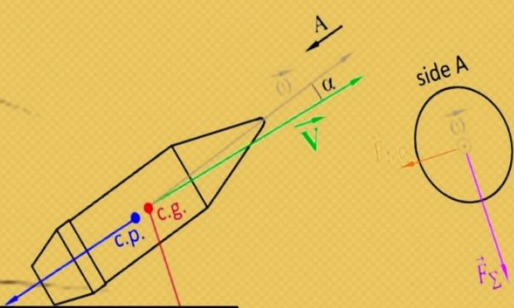


THE CAMPUS CHRONICLES:

WHERE SCIENCE MEETS SUPERHEROES



forces act on a rotating non - reactive free flight: the force of the air, gravity, lateral



Schrödinger's cat: a radioactive source are

THIS IS US

\$ 5.99

It was Ballistics, Flight dynamics, Aeromechanics and Thermodynamics, Control, Computational mathematics.

Ballistics and Hydroaerodynamics, Mechatronics and Robotics, Applied Mechanics, Engineering Physics. I graduated from Ballistics and I can tell you a lot of information!



FIRST ISSUE!

I'm fine here to live

Ooh, that's cool! And yes, we did. But we moved here because of my job.

why exactly from this material

Various implants of human body of the

The Campus Chronicles: Where Science Meets Superheroes

Cover by Dima Postnikov, Denis Lee

Edited by Liudmila A. Mitchell, PhD

Special thanks to Yuliya N. Ryzhikh, PhD, Dean of the Faculty of Physics and Engineering and Olga V. Nagel, PhD, Dean of the Faculty of Foreign Languages



2023

FACULTY OF PHYSICS AND ENGINEERING

Temirlan Seilkhan and Abylai Biahmetov

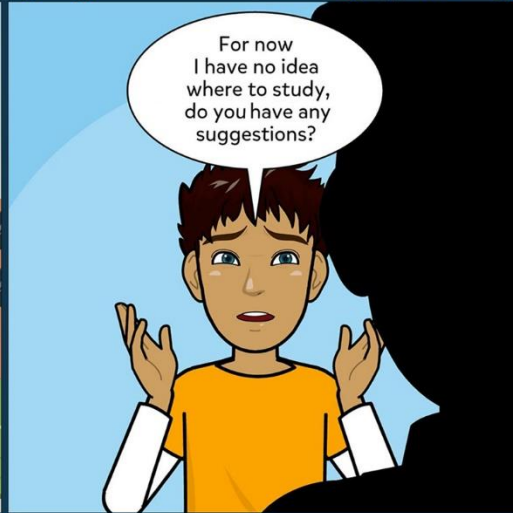


Hello Temirlan! How is it going?

Hello Abylai! Everything is OK!



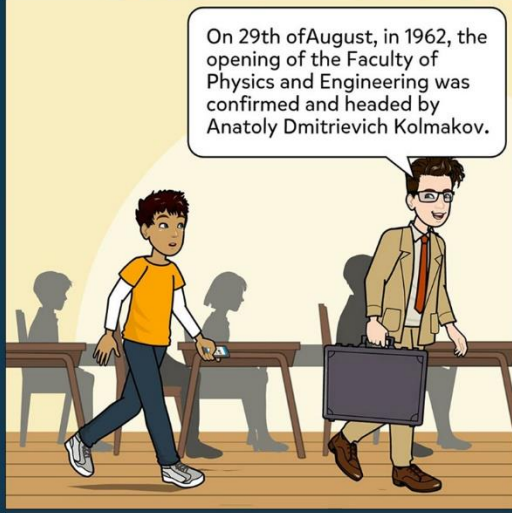
After all, you graduated from high school, what faculty are you going to enter?



For now I have no idea where to study, do you have any suggestions?



Luckily, I have a great idea. I can tell you about the faculty where I studied.

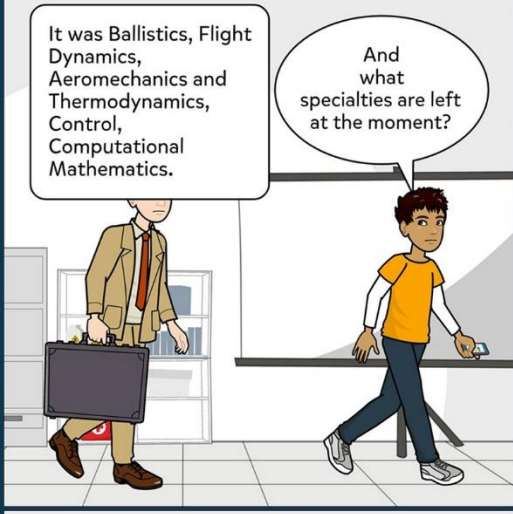


On 29th of August, in 1962, the opening of the Faculty of Physics and Engineering was confirmed and headed by Anatoly Dmitrievich Kolmakov.



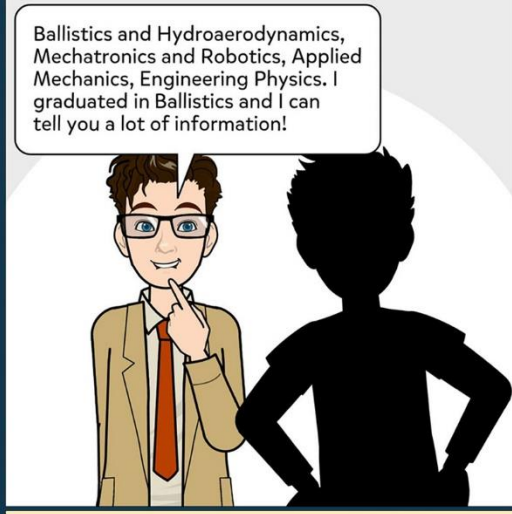
By 1968, a team of scientists, numbering about 80 people and 5 specialties, had formed at the faculty.

And what were the specialties originally?

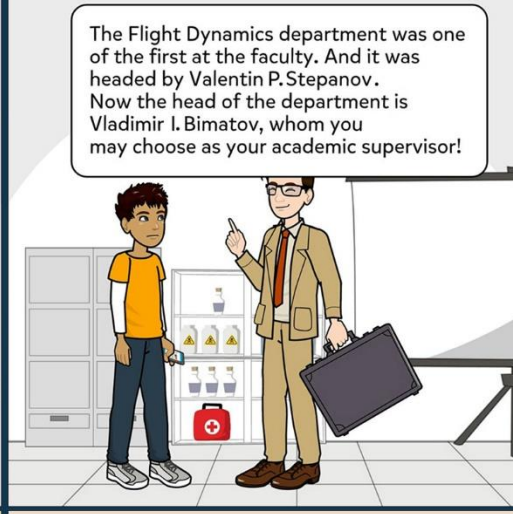


It was Ballistics, Flight Dynamics, Aeromechanics and Thermodynamics, Control, Computational Mathematics.

And what specialties are left at the moment?



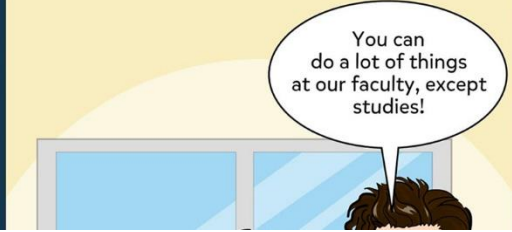
Ballistics and Hydroaerodynamics, Mechatronics and Robotics, Applied Mechanics, Engineering Physics. I graduated in Ballistics and I can tell you a lot of information!



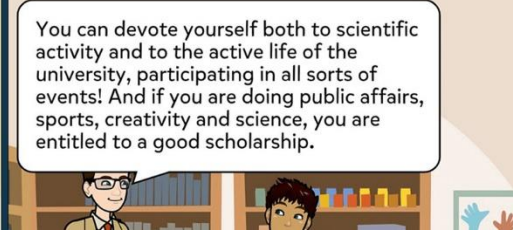
The Flight Dynamics department was one of the first at the faculty. And it was headed by Valentin P. Stepanov. Now the head of the department is Vladimir I. Bimatov, whom you may choose as your academic supervisor!



This is all interesting, of course, but what can you do at the faculty in general?



You can do a lot of things at our faculty, except studies!



You can devote yourself both to scientific activity and to the active life of the university, participating in all sorts of events! And if you are doing public affairs, sports, creativity and science, you are entitled to a good scholarship.



Abylai eventually entered the Faculty of Physics and Engineering and did not regret his choice!



OCCASION ON THE EXAM

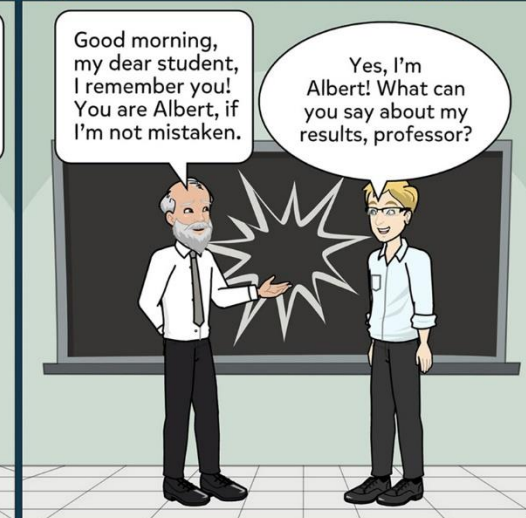
Alyona Litvinova, Danila Borzikov, Albert Iksanov



Oh ! There's not much time left, I have to catch the lecturer!

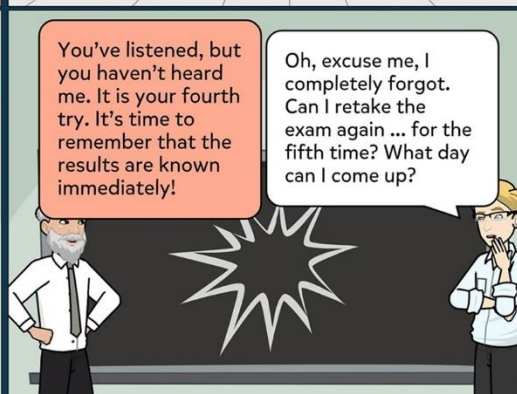
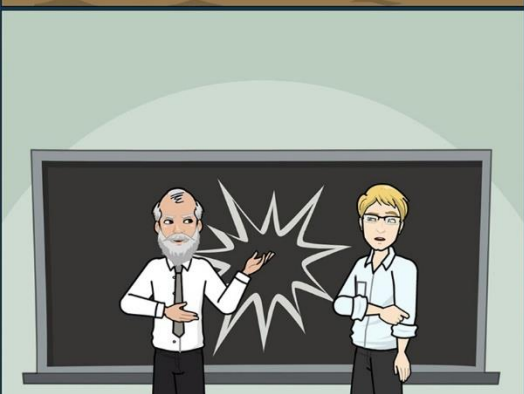


Good morning, Abram Isakovich! It's fate that I caught you here. I didn't receive a letter with the ballistics results, was I able to pass it?



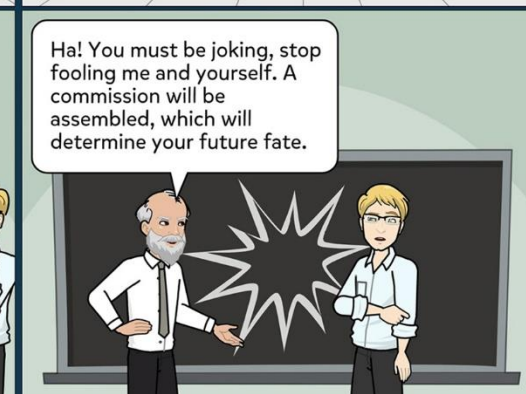
Good morning, my dear student, I remember you! You are Albert, if I'm not mistaken.

Yes, I'm Albert! What can you say about my results, professor?



You've listened, but you haven't heard me. It is your fourth try. It's time to remember that the results are known immediately!

Oh, excuse me, I completely forgot. Can I retake the exam again ... for the fifth time? What day can I come up?



Ha! You must be joking, stop fooling me and yourself. A commission will be assembled, which will determine your future fate.

Abram Isakovich, I passed mechanics and chemistry perfectly, and also successfully received credits in all subjects except ballistics! Can you give me one more chance?

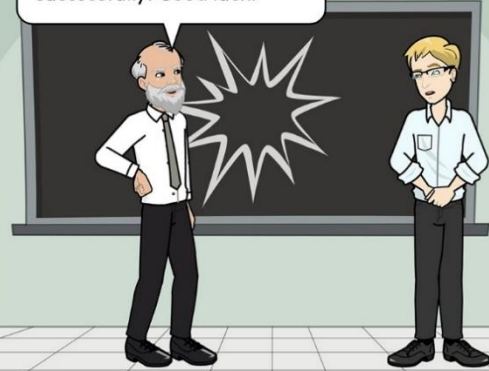


No way, I'm tired of listening to your unprepared speech all the time. I'm willing to listen, if you surprise me with something.... Do you have any ideas?

Let me think...



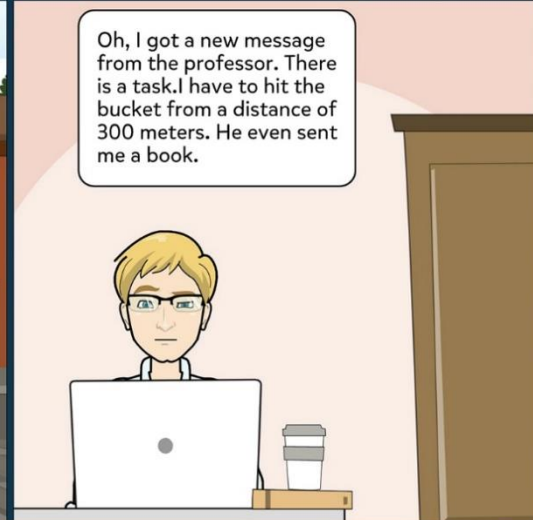
All right, Albert, go home. I'll send an e-mail with a task. If you successfully cope with it, you will pass my subject successfully. Good luck!



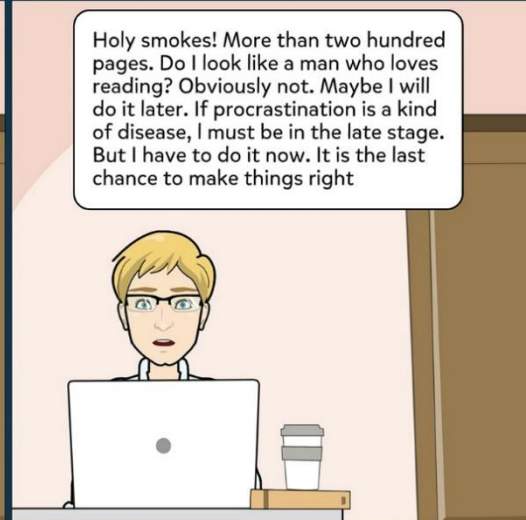
I hope I can do it



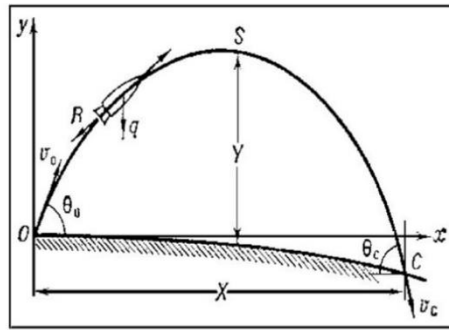
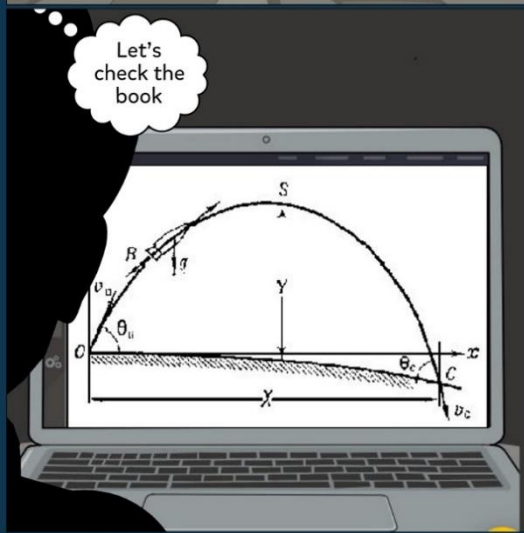
Oh, I got a new message from the professor. There is a task. I have to hit the bucket from a distance of 300 meters. He even sent me a book.



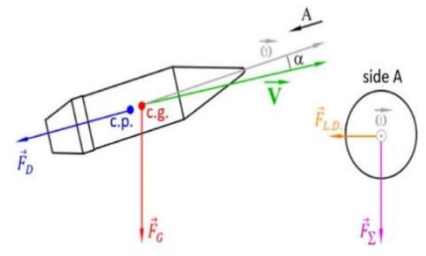
Holy smokes! More than two hundred pages. Do I look like a man who loves reading? Obviously not. Maybe I will do it later. If procrastination is a kind of disease, I must be in the late stage. But I have to do it now. It is the last chance to make things right



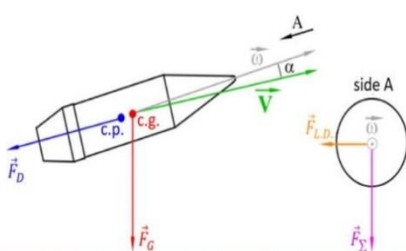
Let's check the book



Consider the simplest case of an axisymmetric projectile flying in the earth's gravity field. It is a curve for the trajectory of the projectile, which, when moving, describes its center of mass. This curve is also called ballistic.

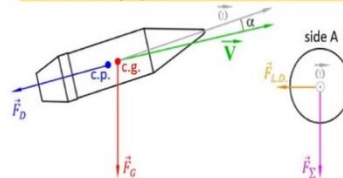


In general, such forces act on a rotating non-reactive projectile during its free flight: the force of the aerodynamic drag of the air, gravity, lateral demolition force

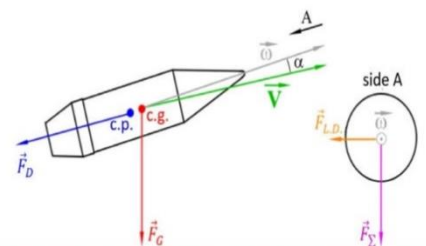


The aerodynamic force relative to the velocity vector of the projectile is traditionally divided into two components – the drag force of the medium directed exactly against the velocity vector and the lifting (or pressing) force in the transverse direction to the velocity vector.

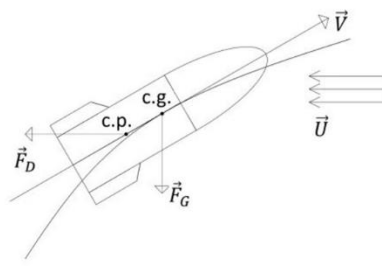
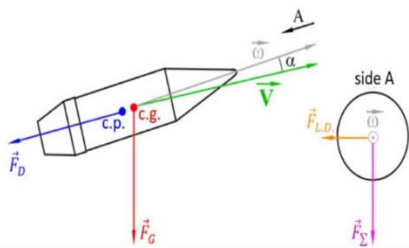
Due to rotation, the flight is stabilized, but at the same time there is a side effect of the projectile leaving in the direction of spin – the resultant of gravity and resistance has a non-zero projection on the axis of rotation and a non-zero shoulder relative to the center of mass of the projectile.



As a result, there is a lateral force acting perpendicular to the plane formed by the axis of rotation and resultant forces of gravity and resistance.



The aerodynamic force relative to the velocity vector of the projectile is traditionally divided into two components – the drag force of the medium directed exactly against the velocity vector and the lifting (or pressing) force in the transverse direction to the velocity vector.



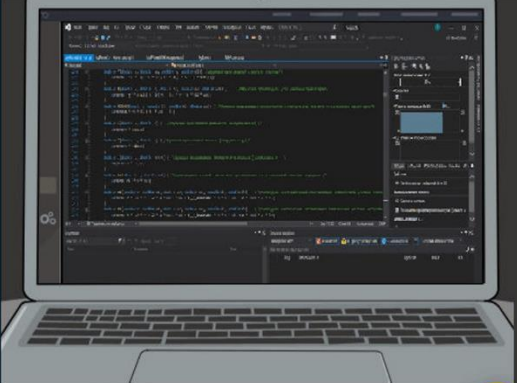
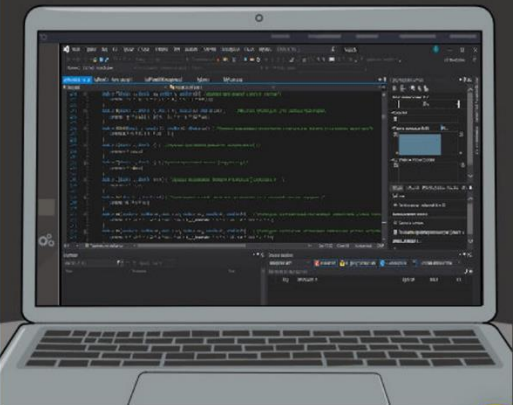
I used a system of differential equations describing how the parameters of the projectile motion change during its free flight. You can equations and programm panel in comments!

The last component can't affect on the flight of the projectile and in practice it can be neglected. The point of application of this force to the projectile is the center of pressure, which usually does not coincide with the center of mass. The position of the center of pressure depends on the shape of the projectile only.

In a simplified case, it can be assumed that only two forces act on a non-rotating projectile without reactive thrust: The force of resistance directed against the speed of movement. Its value is proportional to the characteristic cross-sectional area, the density of the medium and the square of the velocity, C_x is a dimensionless aerodynamic drag coefficient and gravity.

For me to solve this problem, I have to write a program that will solve a system of differential equations using some numerical method.

I think that the Runge-Kutta method of the 5th order of accuracy is the most suitable for solving this system, since it provides high accuracy with a relatively small number of calculations, and it is not difficult to choose the optimal step automatically for it.



$$X_{k+1} = X_k + \frac{1}{6}(k_1 + 2k_2 + 2k_3 + k_4),$$

$$Y_{k+1} = Y_k + \frac{1}{6}(m_1 + 2m_2 + 2m_3 + m_4), \dots,$$

где

$$k_1 = f(t_k, X_k, Y_k, \dots) \Delta t,$$

$$m_1 = g(t_k, X_k, Y_k, \dots) \Delta t, \dots,$$

$$k_2 = f(t_k + \frac{\Delta t}{2}, X_k + \frac{k_1}{2}, Y_k + \frac{m_1}{2}, \dots) \Delta t,$$

$$m_2 = g(t_k + \frac{\Delta t}{2}, X_k + \frac{k_1}{2}, Y_k + \frac{m_1}{2}, \dots) \Delta t, \dots,$$

$$k_3 = f(t_k + \frac{\Delta t}{2}, X_k + \frac{k_2}{2}, Y_k + \frac{m_2}{2}, \dots) \Delta t,$$

$$m_3 = g(t_k + \frac{\Delta t}{2}, X_k + \frac{k_2}{2}, Y_k + \frac{m_2}{2}, \dots) \Delta t, \dots,$$

$$k_4 = f(t_k + \Delta t, X_k + k_3, Y_k + m_3, \dots) \Delta t,$$

$$m_4 = g(t_k + \Delta t, X_k + k_3, Y_k + m_3, \dots) \Delta t, \dots$$

We will recalculate the values of the desired parameters every 0.001 seconds. It is important to remember that with the change in altitude, the parameters of the atmosphere also change, so their values will be recalculated at each step

$$\begin{cases} T = 288.15 - 0.00650 \cdot h \text{ K}, & 0 \text{ m} \leq h < 11000 \text{ m} \\ T = 216.66 \text{ K}, & 11000 \text{ m} \leq h < 25000 \text{ m} \end{cases}$$

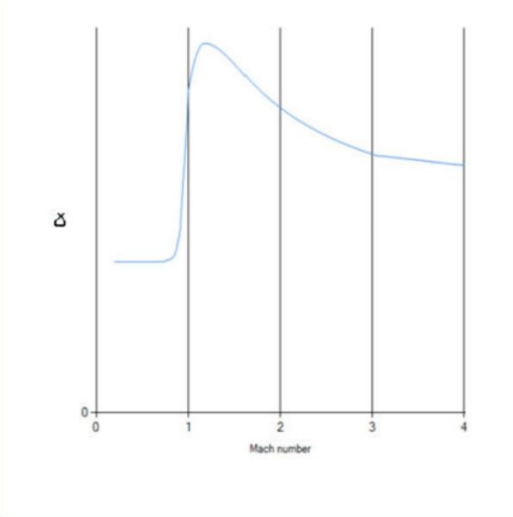
$$\begin{cases} q = q_0 \cdot (1 - 2.256 \cdot 10^{-5} h)^{4.256} \frac{\text{kg}}{\text{m}^3}, & 0 \text{ m} \leq h < 11000 \text{ m} \\ q = q_0 \cdot 0.29784 e^{-\frac{h-11000}{6342}} \frac{\text{kg}}{\text{m}^3}, & 11000 \text{ m} \leq h < 25000 \text{ m} \end{cases}$$

$$a = \sqrt{\frac{\omega RT}{M}} \quad M = \frac{v}{a}$$

It is also necessary to recalculate the speed of sound, the Mach number and the aerodynamic coefficient of air resistance, according to the written formulas:

$$C_x = \begin{cases} 0.0301 - 0.011M, & 3.06 < M \leq 3.53 \\ 0.29(M)^{-1} + 0.172, & 1.62 < M \leq 3.06 \\ 0.384 \sin(1.85(M)^{-1}), & 1.18 < M \leq 1.62 \\ 0.384 - 1.6(M - 1.176)^2, & 1 < M \leq 1.18 \\ 1.5M - 1.176, & 0.91 < M \leq 1 \\ 0.161 + 3.9(M - 0.823)^2, & 0.82 < M \leq 0.91 \\ 0.033M + 0.133, & 0.73 < M \leq 0.82 \\ 0.157, & M < 0.73 \end{cases}$$

We will recalculate temperature, air density, speed of sound at each step and the Mach number at each step



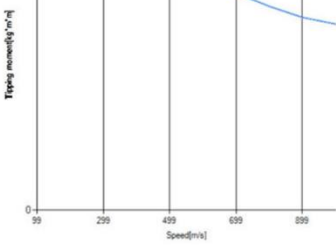
$$M_{mm} = \begin{cases} 1.17 \cdot 10^{-3}, & v < 275 \text{ m/s} \\ 1.17 \cdot 10^{-4} + (v - 275) \cdot \left(\frac{1.34 - 1.17}{25} \right) \cdot 10^{-3}, & 275 \text{ m/s} < v \leq 300 \text{ m/s} \\ 1.34 \cdot 10^{-4} + (v - 300) \cdot \left(\frac{1.37 - 1.34}{25} \right) \cdot 10^{-3}, & 300 \text{ m/s} < v \leq 325 \text{ m/s} \\ 1.37 \cdot 10^{-4} + (v - 325) \cdot \left(\frac{1.36 - 1.37}{25} \right) \cdot 10^{-3}, & 325 \text{ m/s} < v \leq 350 \text{ m/s} \\ 1.36 \cdot 10^{-4} + (v - 350) \cdot \left(\frac{1.32 - 1.36}{25} \right) \cdot 10^{-3}, & 350 \text{ m/s} < v \leq 375 \text{ m/s} \\ 1.32 \cdot 10^{-4} + (v - 375) \cdot \left(\frac{1.28 - 1.32}{25} \right) \cdot 10^{-3}, & 375 \text{ m/s} < v \leq 400 \text{ m/s} \\ 1.28 \cdot 10^{-4} + (v - 400) \cdot \left(\frac{1.21 - 1.28}{50} \right) \cdot 10^{-3}, & 400 \text{ m/s} < v \leq 450 \text{ m/s} \\ 1.21 \cdot 10^{-4} + (v - 450) \cdot \left(\frac{1.16 - 1.21}{50} \right) \cdot 10^{-3}, & 450 \text{ m/s} < v \leq 500 \text{ m/s} \\ 1.16 \cdot 10^{-4} + (v - 500) \cdot \left(\frac{1.06 - 1.16}{100} \right) \cdot 10^{-3}, & 500 \text{ m/s} < v \leq 600 \text{ m/s} \end{cases}$$

$$M_{mm} = \begin{cases} 1.06 \cdot 10^{-3} + (v - 600) \cdot \left(\frac{0.98 - 1.06}{100} \right) \cdot 10^{-3}, & 600 \text{ m/s} < v \leq 700 \text{ m/s} \\ 0.98 \cdot 10^{-3} + (v - 700) \cdot \left(\frac{0.92 - 0.98}{100} \right) \cdot 10^{-3}, & 700 \text{ m/s} < v \leq 800 \text{ m/s} \\ 0.92 \cdot 10^{-3} + (v - 800) \cdot \left(\frac{0.87 - 0.92}{100} \right) \cdot 10^{-3}, & 800 \text{ m/s} < v \leq 900 \text{ m/s} \\ 0.87 \cdot 10^{-3} + (v - 900) \cdot \left(\frac{0.84 - 0.87}{100} \right) \cdot 10^{-3}, & 900 \text{ m/s} < v \leq 1000 \text{ m/s} \\ 0.84 \cdot 10^{-3} + (v - 1000) \cdot \left(\frac{0.82 - 0.84}{100} \right) \cdot 10^{-3}, & 1000 \text{ m/s} < v \leq 1100 \text{ m/s} \\ 0.82 \cdot 10^{-3} + (v - 1100) \cdot \left(\frac{0.81 - 0.82}{100} \right) \cdot 10^{-3}, & 1100 \text{ m/s} < v \leq 1200 \text{ m/s} \\ 0.81 \cdot 10^{-3} + (v - 1200) \cdot \left(\frac{0.80 - 0.81}{100} \right) \cdot 10^{-3}, & 1200 \text{ m/s} < v \leq 1280 \text{ m/s} \\ 0.8 \cdot 10^{-3}, & 1280 \text{ m/s} \leq v \end{cases}$$

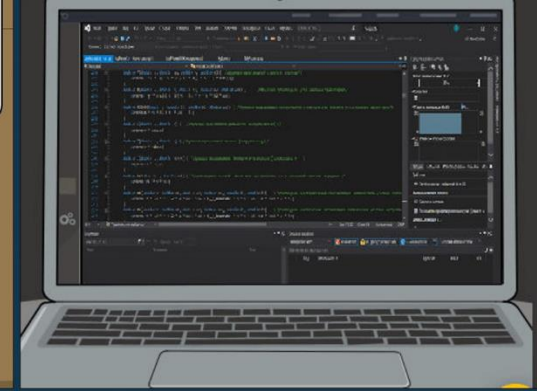


After starting, the program outputs the received data at each point through the selected step, so we get the values: projectile velocity; the angle of inclination of the tangent trajectory to the horizon: course angle:

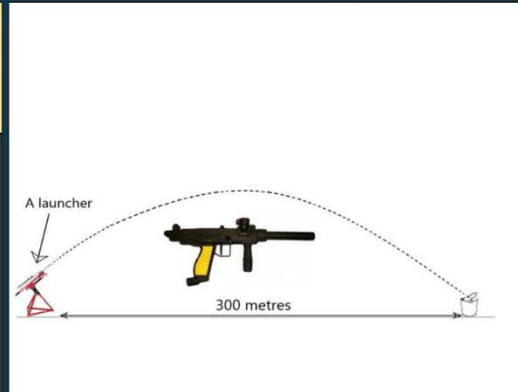
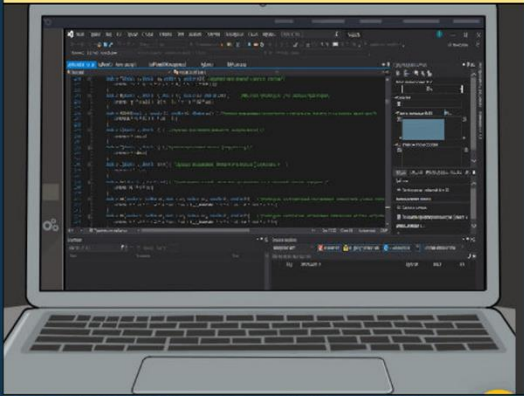
To calculate the necessary parameters for our task, we will enter the calculation completion parameter when the x coordinate reached is 300 m and the height is zero. We will shoot in the absence of wind. We will select the necessary values of angle of inclination.



trajectory to the horizon; course angle, coordinates of the projectile; angular velocity in projection on the x-axis of the associated coordinate system; the angle of rotation of the projectile around the symmetry



According to the calculation results, it turned out that for a bullet of 17.17 mm caliber, weighing 3.2 g. you need to shoot at an initial speed of 60,72 m / s, it is necessary that the throwing angle is equal to 63 degrees.

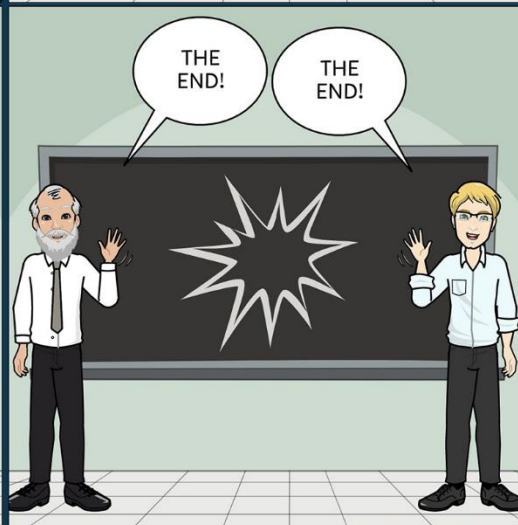
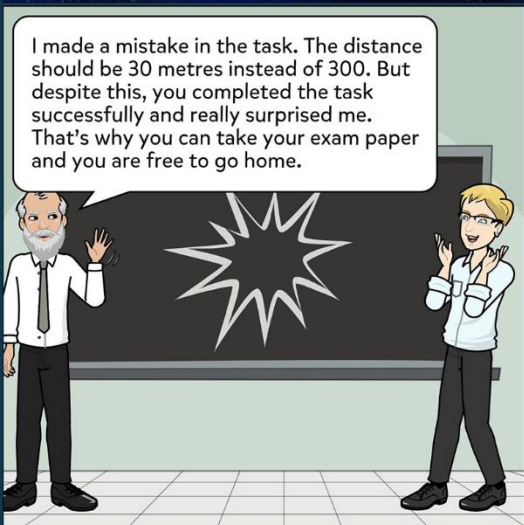
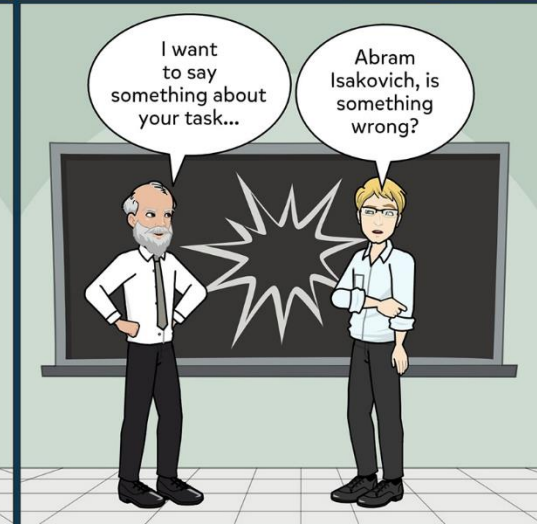
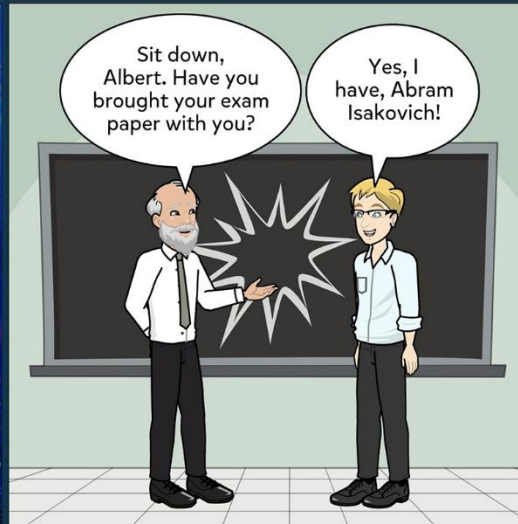


We can use a paintball gun as a weapon! The ball diameter is 0.68 inches (17.17 mm), this is a common caliber, weighs an average of 3.2 g. I took a paintball: caliber 0.01717m; weight 0.0032 kg; muzzle velocity 60.72 m/s.

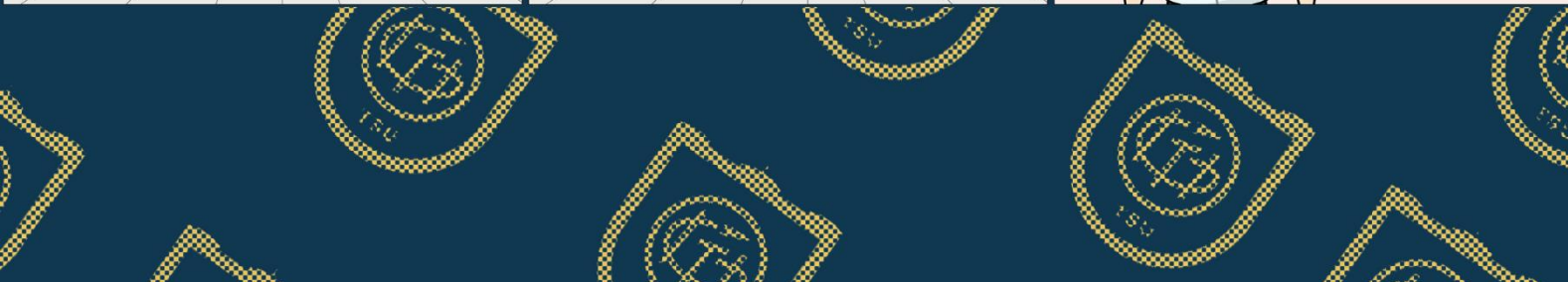
Amazing! It looks pretty good. I'm exhausted, but it was worth it. As the old saying goes, "No bees, no honey; no work, no money." Now I can send my task to a professor!



A FEW MOMENTS LATER



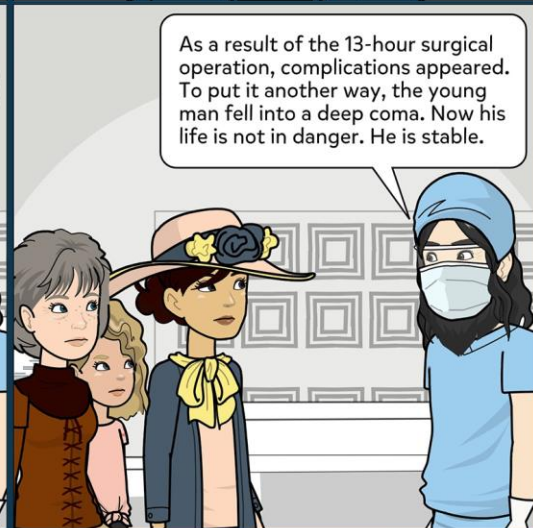
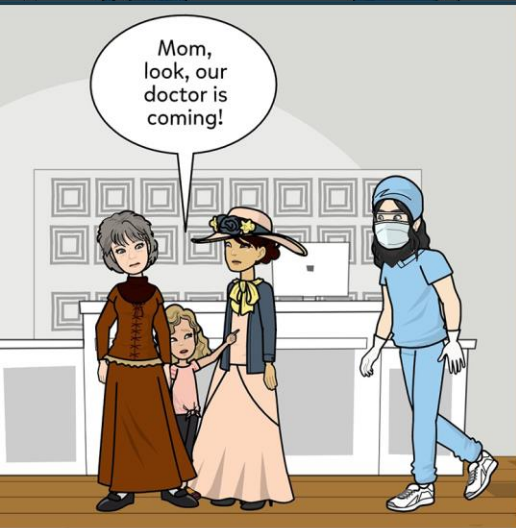
The story, all names, characters, and incidents portrayed in this work are fictitious. No identification with actual persons (living or deceased), places, buildings, and products is intended or should be inferred.

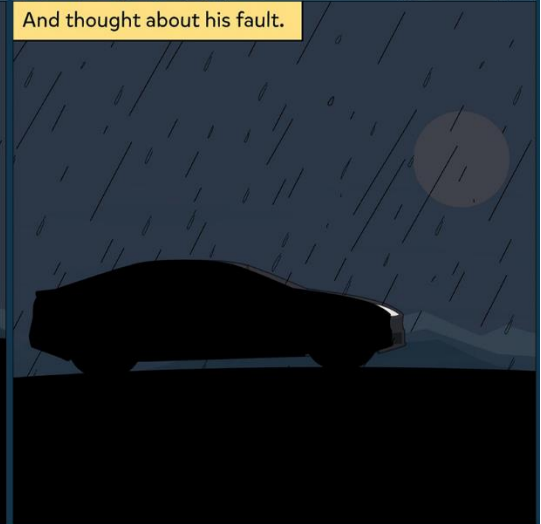
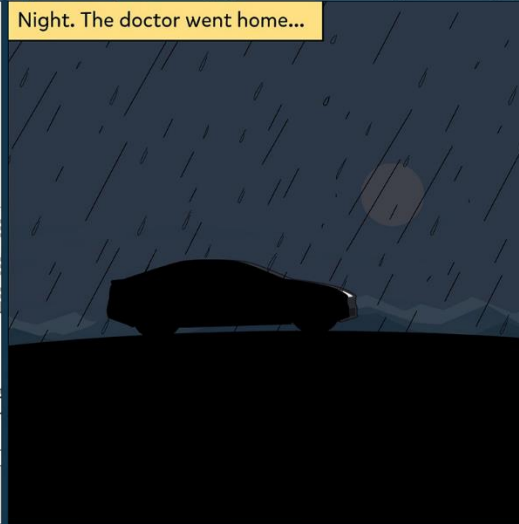
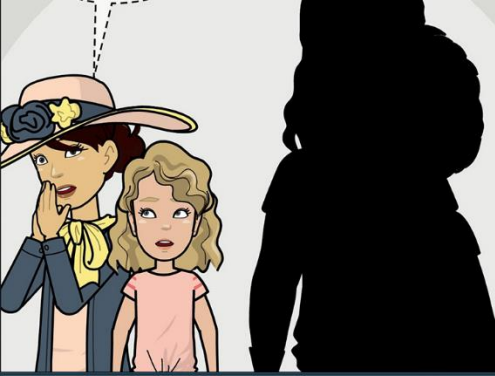


QUANTUM THEORY

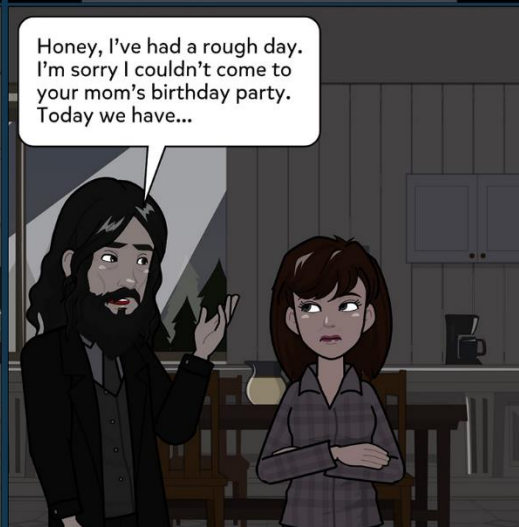
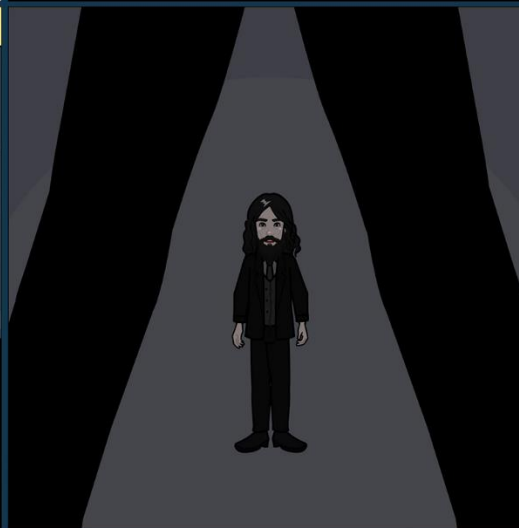
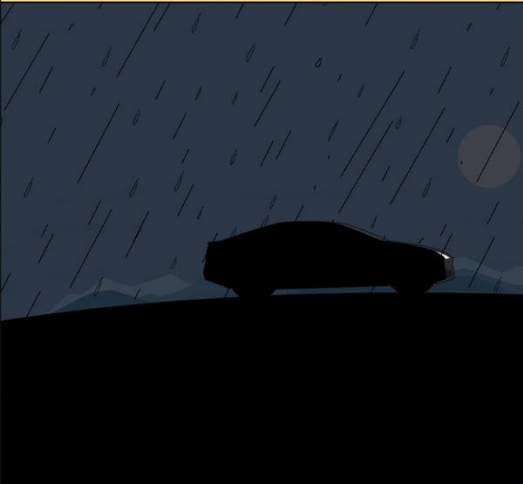
Sergey Bogdanov, Ivan Polyakov

Voiced version: <https://drive.google.com/file/d/1yZPArij-CVY73yxHDfXL3q2VtIUqtAm6/view>

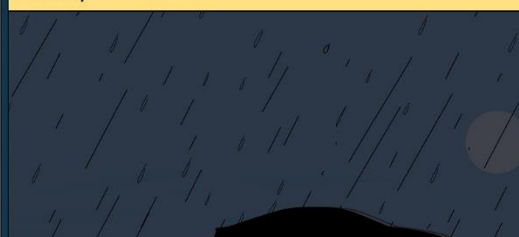




But, when he had gone, there was something bad.

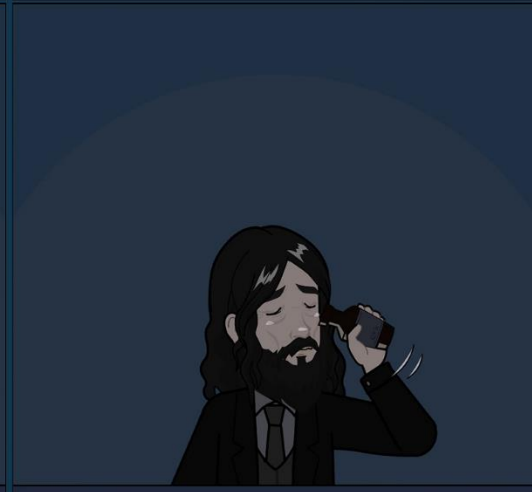


Never before had the doctor experienced so much in one day



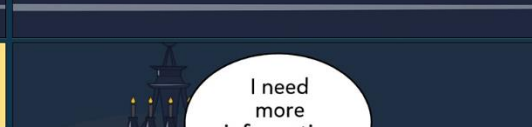
Our doctor decided to go to a bar. He had never made such decisions before...





in his thoughts, he flew further and further into dreams

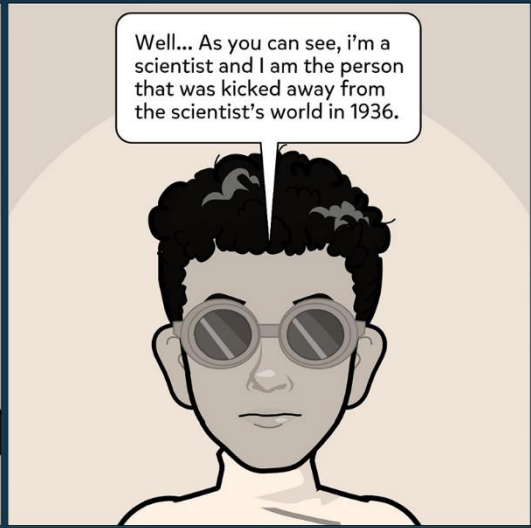
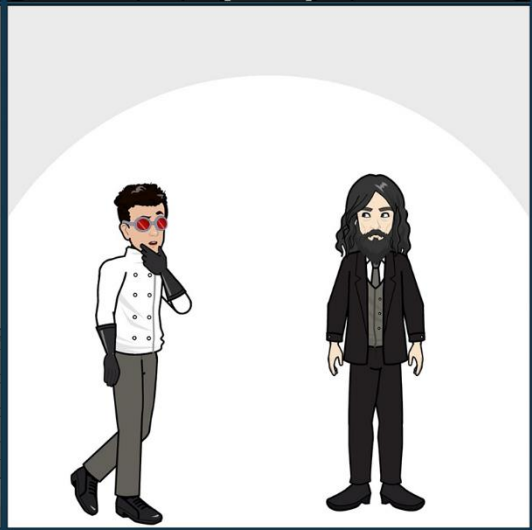
Suddenly, the doctor remembered a lecture on quantum physics. They said something about immortality there



Those scientists said that an observer cannot die. I hope that library is open now



Someone crashed into the back of his car



But the scientist doesn't care about questions and

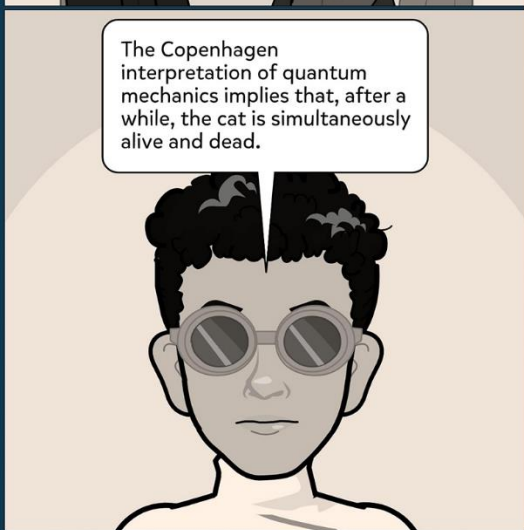
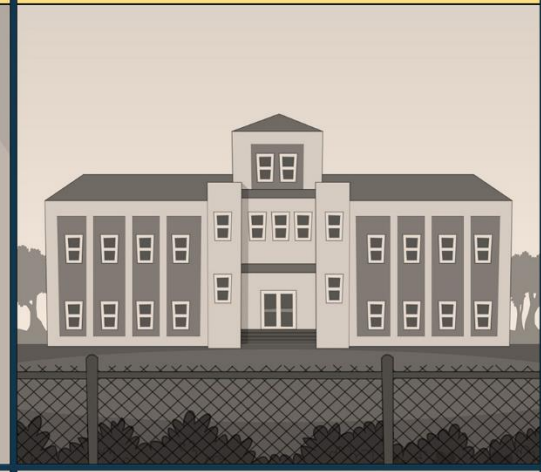
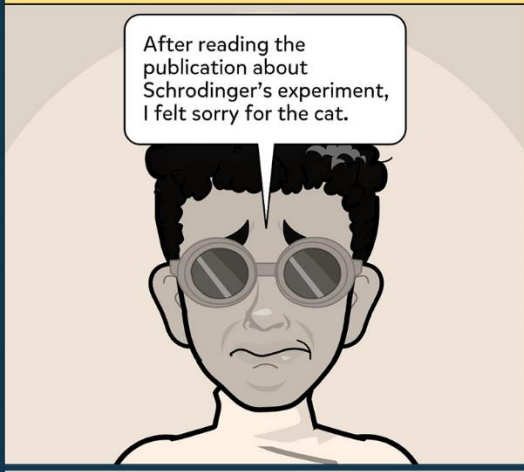
I thought, what if I became a cat. For my thoughts and

to the cat I was ignominiously expelled from the

But the scientist doesn't care about questions and resumed to talk about his strange things

I thought, what if I became a cat. For my thoughts and sympathy to...

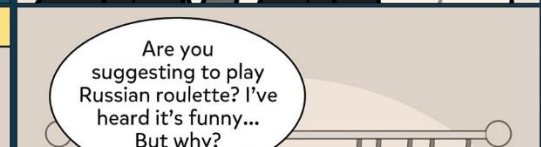
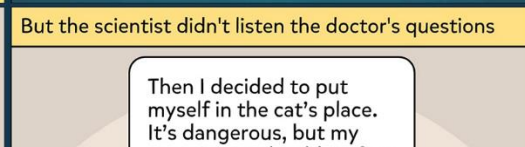
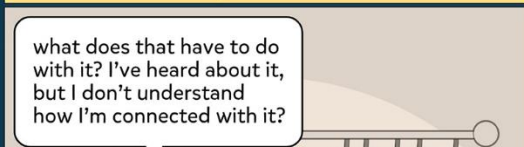
...to the cat I was ignominiously expelled from the scientific paradise and ...



Yet, when one looks in the box, one sees the cat either alive or dead, not both alive and dead.

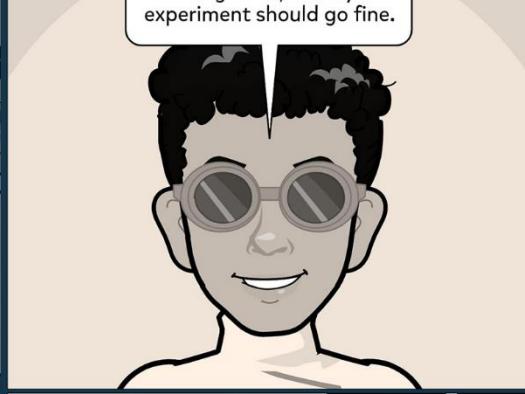


If an internal monitor (e.g. Geiger counter) detects radioactivity (i.e. a single atom decaying), the flask is shattered, releasing the poison, which kills the cat.





experiment should go fine.



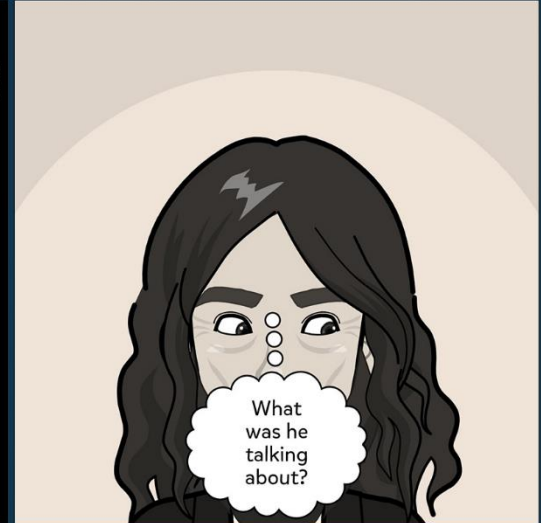
But why?



I mean, if you are "the cat" - you can't die. It is just because you are observer. You can be an observer only when you are aware of yourself, and you are aware of yourself only when you are alive. It's a quantum immortality, understand? Anyway, you will get your answers, friend



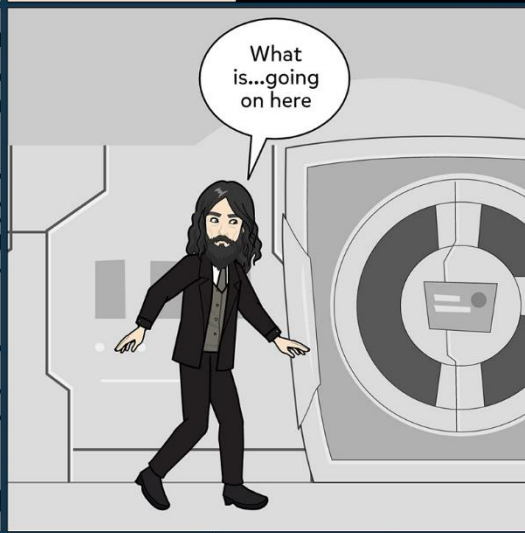
This fool will never figure out!!! HAHAAHHA



What was he talking about?



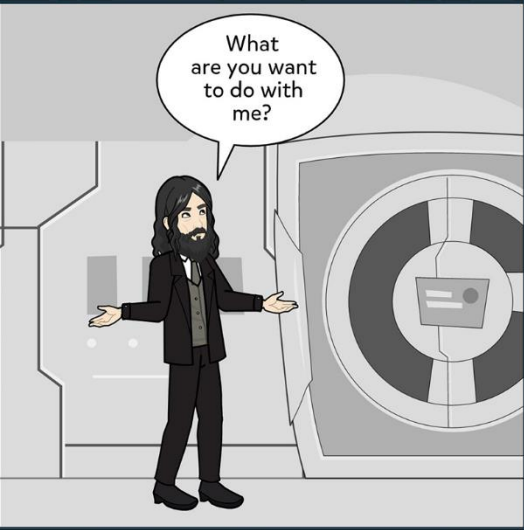
What is...going on here



I'm in the room next to you and see you perfectly. Open your eyes wider and wait for answers, man!



What are you want to do with me?



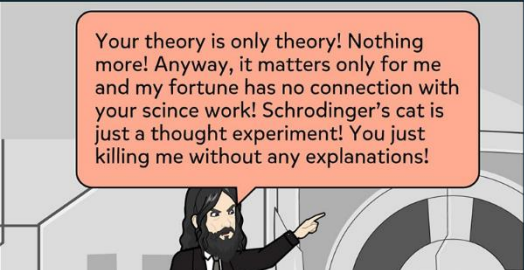
Try your fortune. Say "mew" like a true cat



You gonna stay alive, yeah? You will. If i'm right



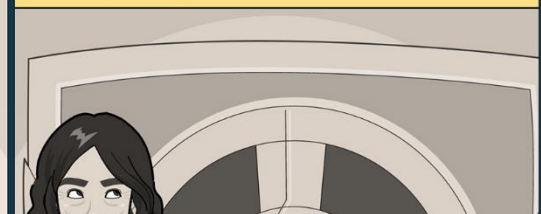
Your theory is only theory! Nothing more! Anyway, it matters only for me and my fortune has no connection with your science work! Schrodinger's cat is just a thought experiment! You just killing me without any explanations!

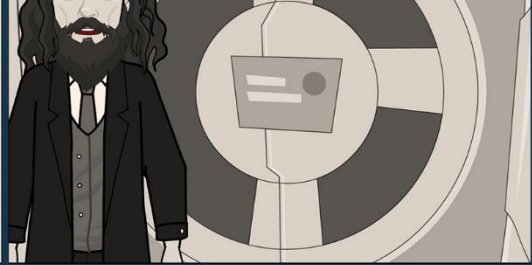


You will never understand my experiment. You are still alive, but... let's begin



Your consciousness is now being transferred to all the universes where you are alive

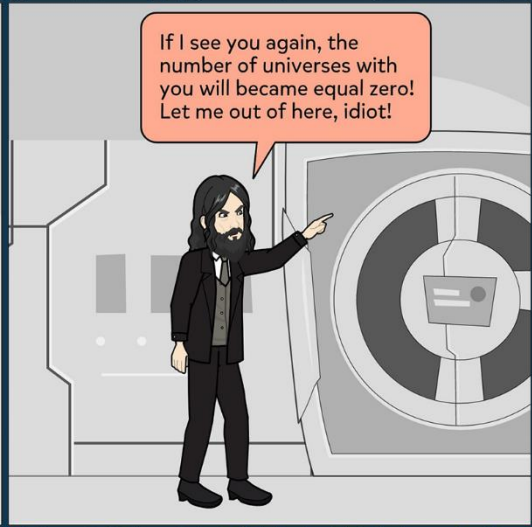
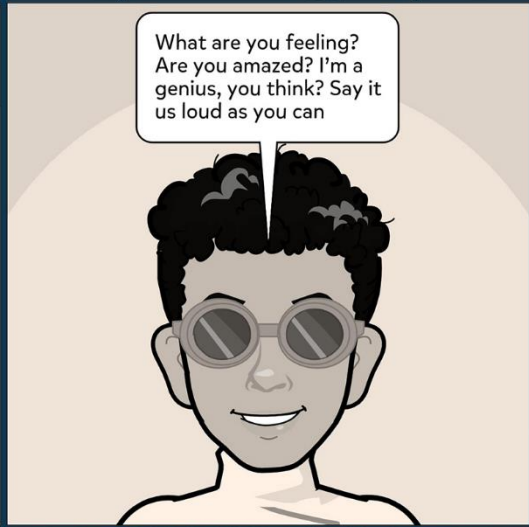
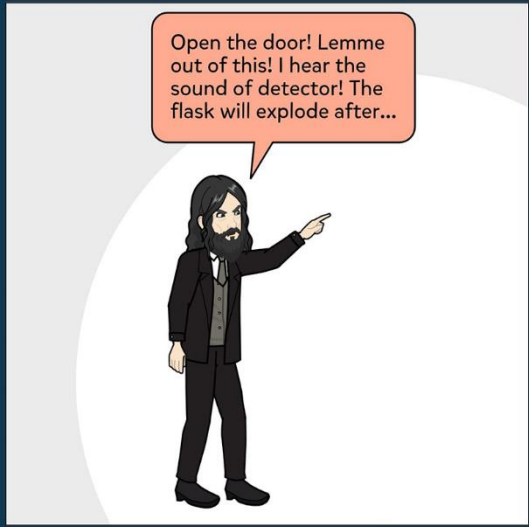




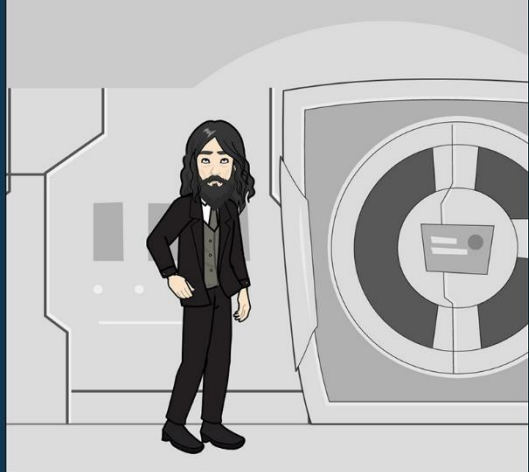
Open the door! Lemme out of this! I hear the sound of detector! The flask will explode after...

What are you feeling? Are you amazed? I'm a genius, you think? Say it us loud as you can

If I see you again, the number of universes with you will became equal zero! Let me out of here, idiot!



He is alive and hear your voice, madam



He regains consciousness

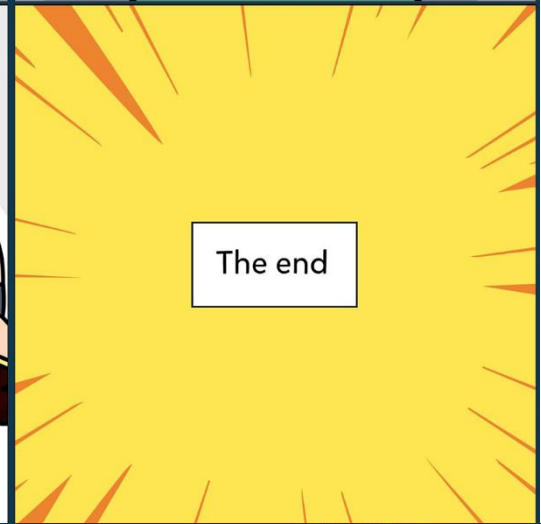
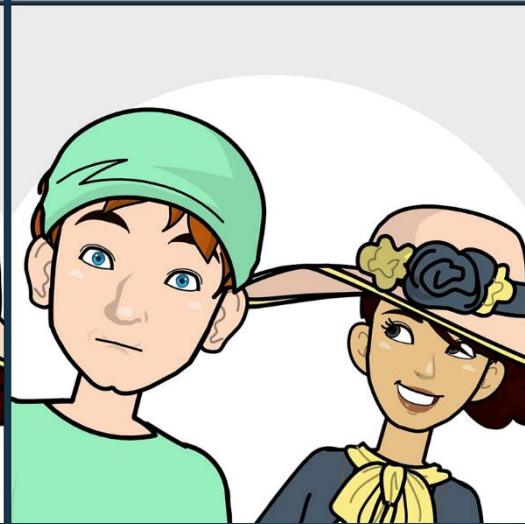
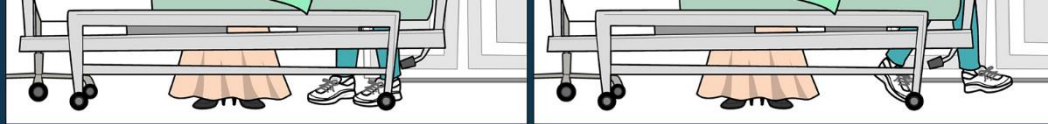


Alan, how do you feel? I'm your doctor. You were in a coma for about a month after brain surgery. Do not make sudden movements.

Honey, are you ok? I was so worried.

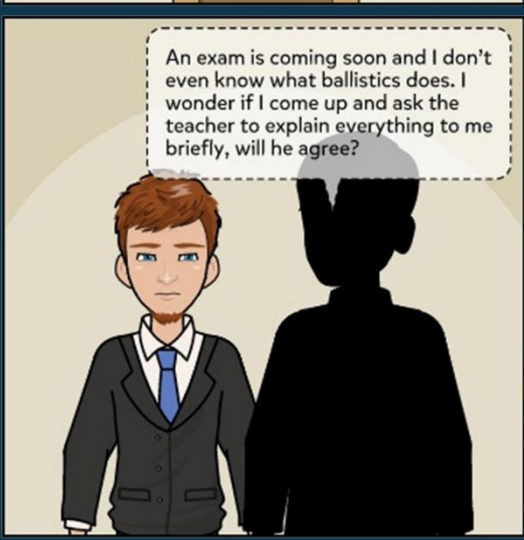
I'm okay, but... I was seeng the dream all. I was a doctor there and I scolded with you. Then I got drunk and crashed my car. And then there was something with cats and scientists. It feels so realistic, so I...

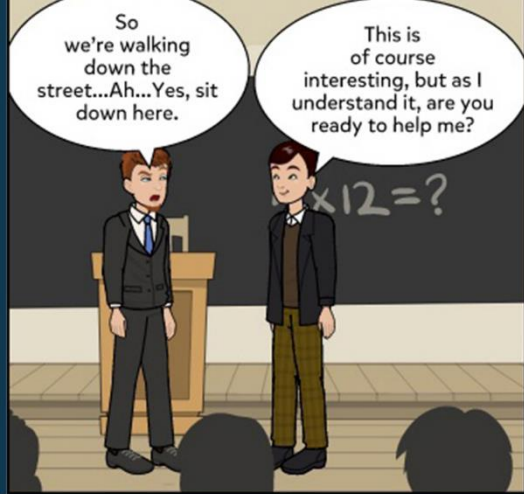




LECTURE ON BALLISTICS

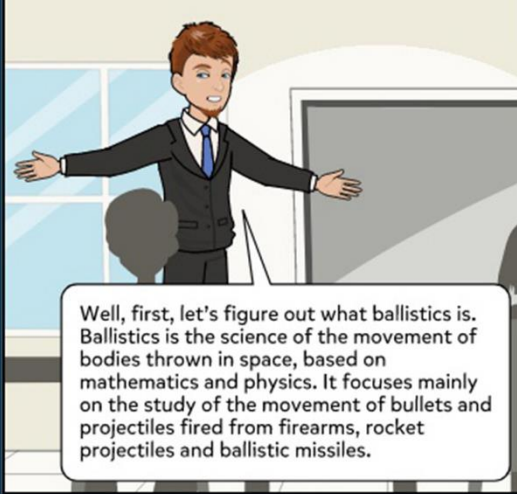
Alexey Gruzdev





So we're walking down the street...Ah...Yes, sit down here.

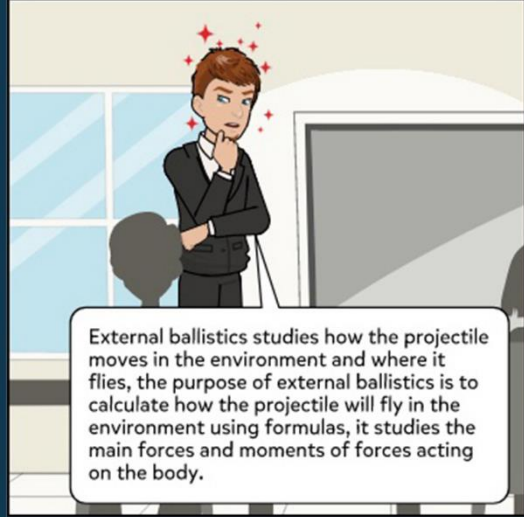
This is of course interesting, but as I understand it, are you ready to help me?



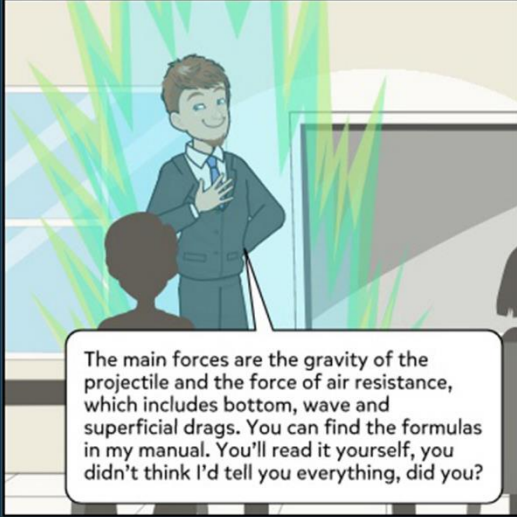
Well, first, let's figure out what ballistics is. Ballistics is the science of the movement of bodies thrown in space, based on mathematics and physics. It focuses mainly on the study of the movement of bullets and projectiles fired from firearms, rocket projectiles and ballistic missiles.



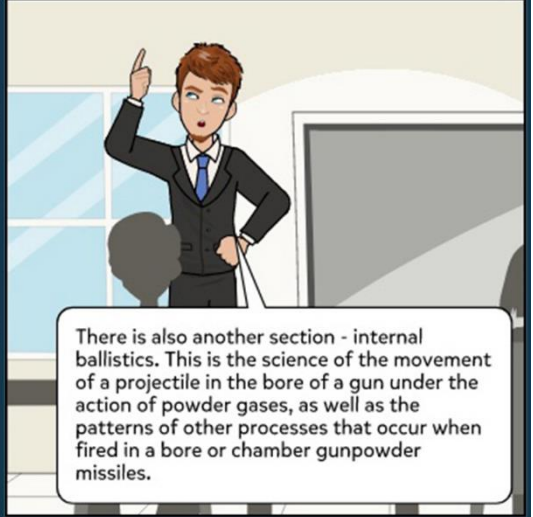
In short, you take a gun and shoot, and then you look where and how the bullet flew or rocket...Ballistics includes internal and external ballistics, these are different disciplines, but they are inextricably linked.



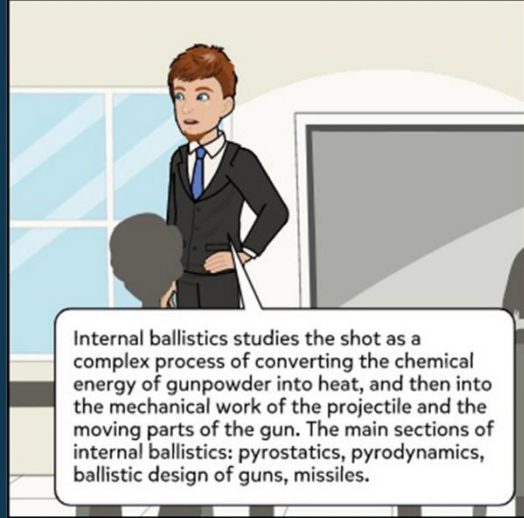
External ballistics studies how the projectile moves in the environment and where it flies, the purpose of external ballistics is to calculate how the projectile will fly in the environment using formulas, it studies the main forces and moments of forces acting on the body.



The main forces are the gravity of the projectile and the force of air resistance, which includes bottom, wave and superficial drags. You can find the formulas in my manual. You'll read it yourself, you didn't think I'd tell you everything, did you?



There is also another section - internal ballistics. This is the section of the movement of a projectile in the bore of a gun under the action of powder gases, as well as the patterns of other processes that occur when fired in a bore or chamber gunpowder missiles.



Internal ballistics studies the shot as a complex process of converting the chemical energy of gunpowder into heat, and then into the mechanical work of the projectile and the moving parts of the gun. The main sections of internal ballistics: pyrostatics, pyrodynamics, ballistic design of guns, missiles.



Ummm?..



He fell asleep again...Okay...I'll just leave, he will probably wake up not soon, so he will be punished by himself...



ME IN ROBOTICS

Alina Martynova

Today everyone will present their reports on their experience in robotics. I need to get ready

“Question 1: What is your experience in robotics engineering?”

An imaginary scene

My experience in robotics started from my brother, he is a robot football coach. He told me a lot about robotics and I got interested.

I started learning how to solder and model in CAD systems such as Fusion. Later I tried my hand at microcontroller programming.

“Question 2: What areas are you most familiar with?”

The most familiar to me the field of industrial and special robotics as my specialty.

But at the moment my activity are centered around microcontroller programming and soldering.

In the future, I would like to study the topic of artificial intelligence and modeling and deepen my knowledge in IT

“Question 3: What areas do you find the most challenging?”

And about AI. I think it is one of the most challenging area for the moment. AI and machine learning are still understudied

But AI is already a part of our everyday life - streaming services such as Netflix or Yandex.Music uses AI to offer you movies or

The most challenging area for me is everything about hard mathematical analysis. I find it difficult to work with such abstract concepts. But I

learning are still understudied and have ethical constraints that may affect their research.



uses AI to offer you movies or music based on your preferences. We can't underestimate AI.



such abstract concepts. But I understand that is important skill for robotics engineer.



That's all I wanted to say. Thanks for attention!



I think it's not that bad



THE STORY OF OUR ADMISSION TO TOMSK STATE UNIVERSITY

Daria Konsevich, Evgenia Chura

Hi, today Evgenia and I will tell you about our first impressions and thoughts about the Faculty of Physics and Engineering.

Yes, it's very interesting story



It was in the summer when we applied for admission.



Our future teacher Kuat told us about the advantages of faculties.

we were told that there is a special laboratory in which experiments are carried out ...



maybe something terrible is going on...



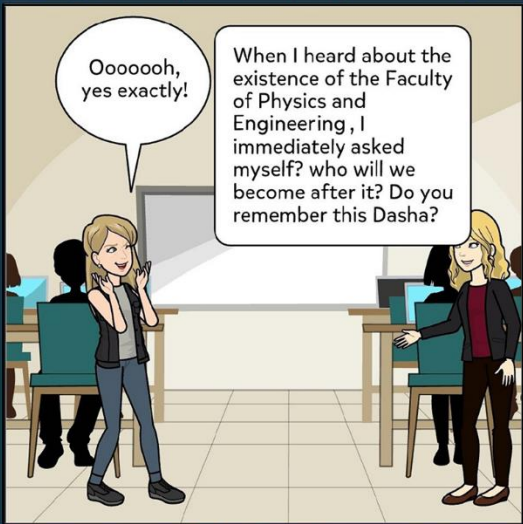
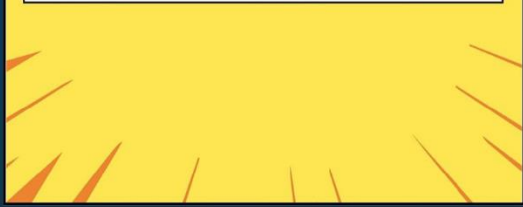
And when he started talking about the faculty of Physics and Engineering, we began to imagine ...

maybe they're experimenting on humans...?



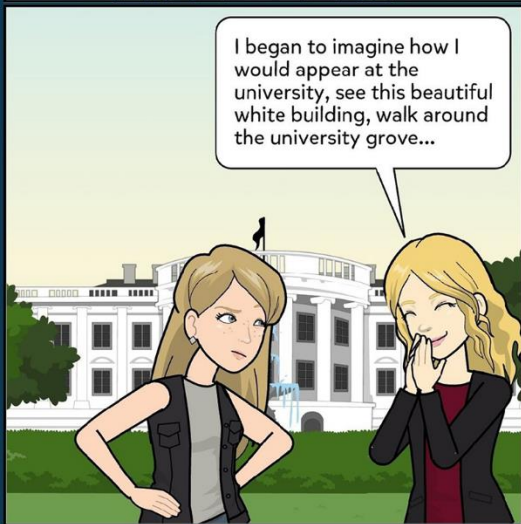
Okay... sorry

Dasha, this was not ... personally, I did not think so.



Ooooooh, yes exactly!

When I heard about the existence of the Faculty of Physics and Engineering, I immediately asked myself? who will we become after it? Do you remember this Dasha?



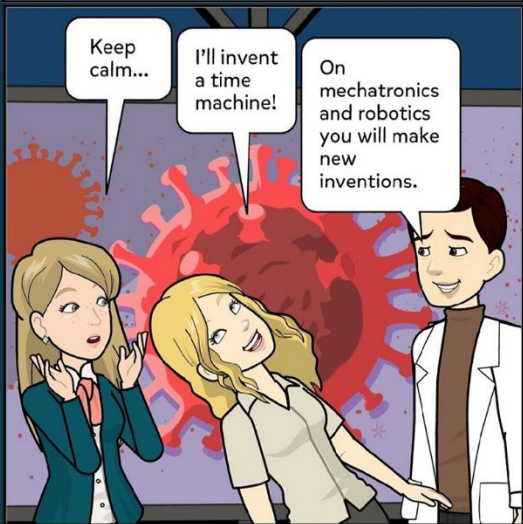
I began to imagine how I would appear at the university, see this beautiful white building, walk around the university grove...



In the direction of applied mechanics, you will make inventions in mechanical engineering and construction

I will build cars!!!!!!!

Zhenua, keep calm...



Keep calm...

I'll invent a time machine!

On mechatronics and robotics you will make new inventions.



Rooooockets

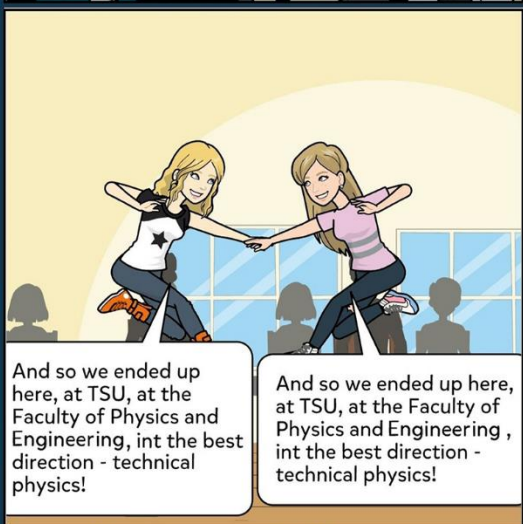
On balistics, you will build missiles and weapons.



In technical physics, you will make gunpowder from cotton wool and blow it up in the basement...

Hooraaaaay, gunpowder!!!!

Zhenya...



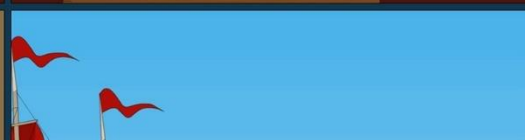
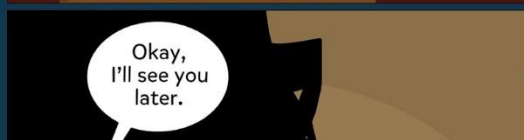
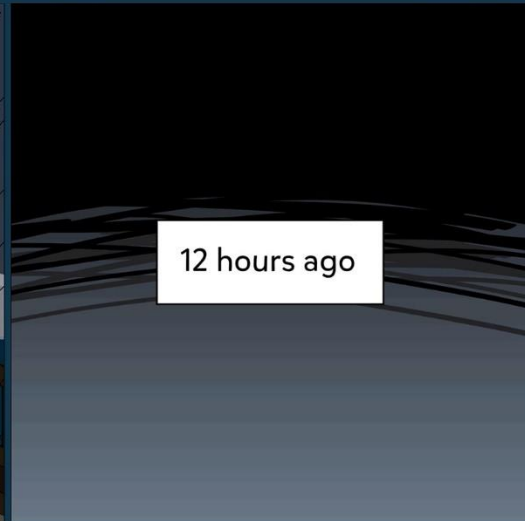
And so we ended up here, at TSU, at the Faculty of Physics and Engineering, in the best direction - technical physics!

And so we ended up here, at TSU, at the Faculty of Physics and Engineering, in the best direction - technical physics!



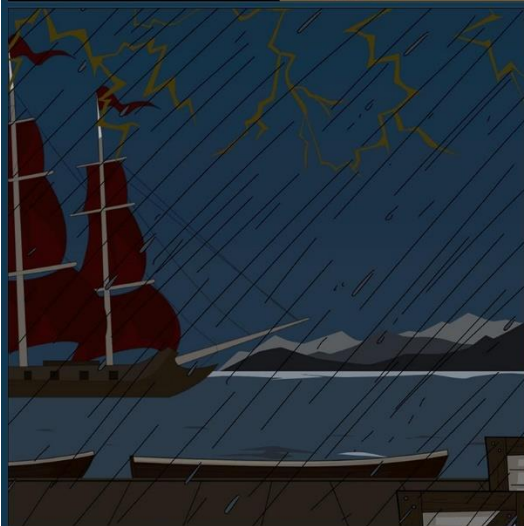
VLAD PIRATE AND ROMAN SORCERER vs STORM

Vlad Fedorov, Roman Sorokin

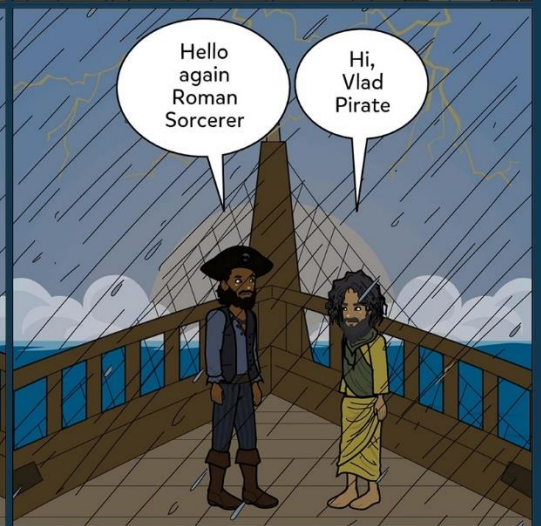




Oh Roma, if you only knew who I really am....



damn what a heavy rain...



Hello again Roman Sorcerer

Hi, Vlad Pirate



Listen, sorcerer, can you save us from this storm. Anchor me in the bay

Yes, but for this I need to say a complex spell in an ancient language and you will have to repeat after me



And so, repeat after me : "Uvuvwevwevwe Onyetenvevwe Ugwemubwem Usas"



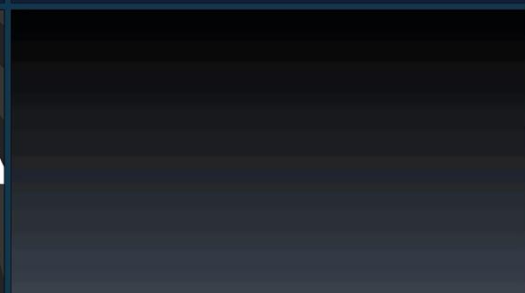
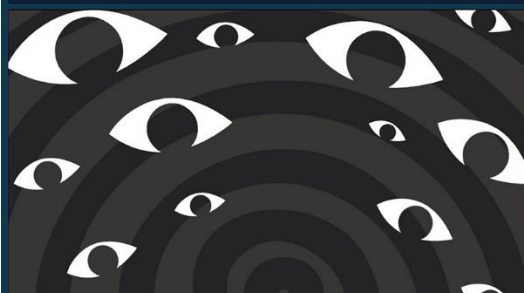
Where am I? What happened?

I am a temporary experience, you have read the forbidden words and for this you will surf the cosmos FOREVER!



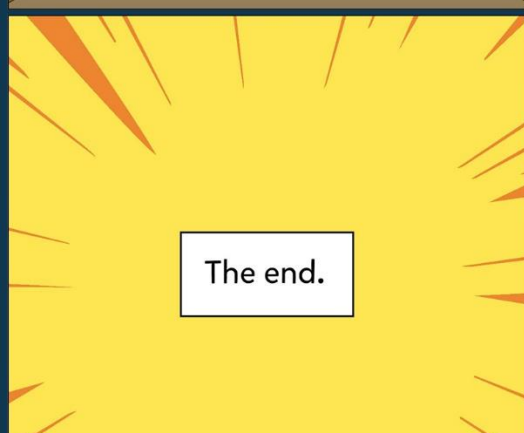
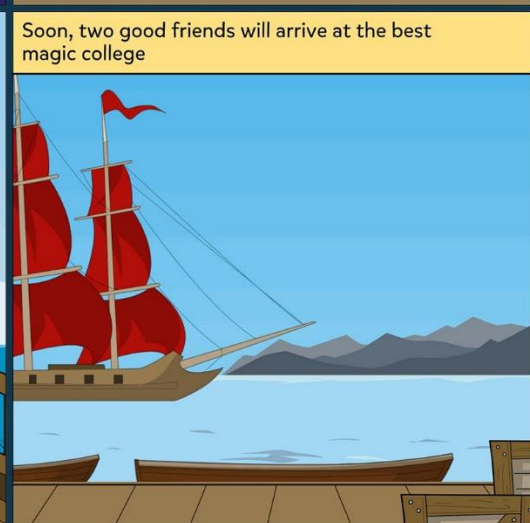
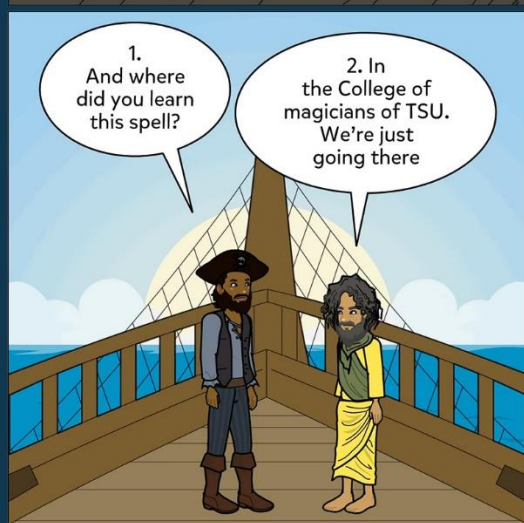
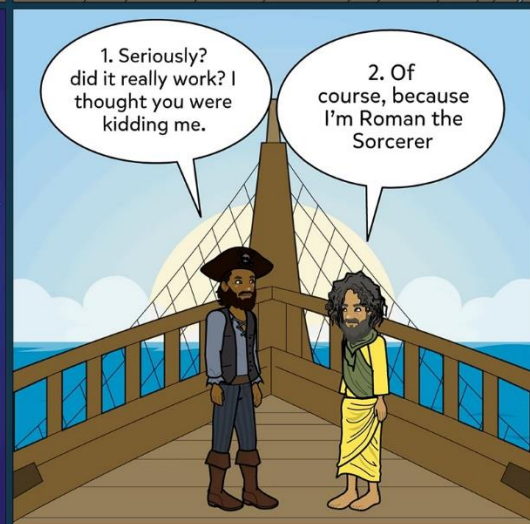
I was just trying to save us and get to a better university.

If so, then I will have mercy on you, and I will make sure that you can say the right spell



...?

Great, I'm back

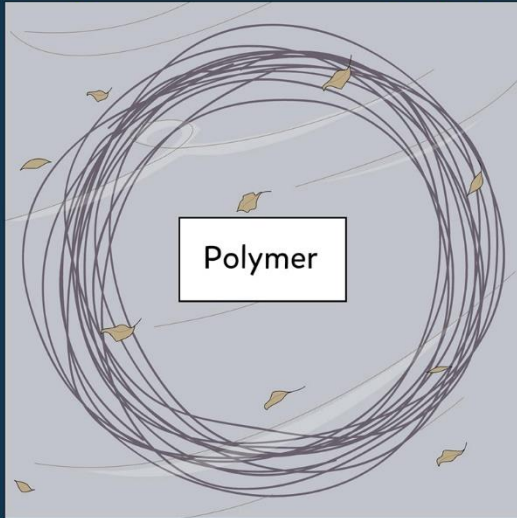




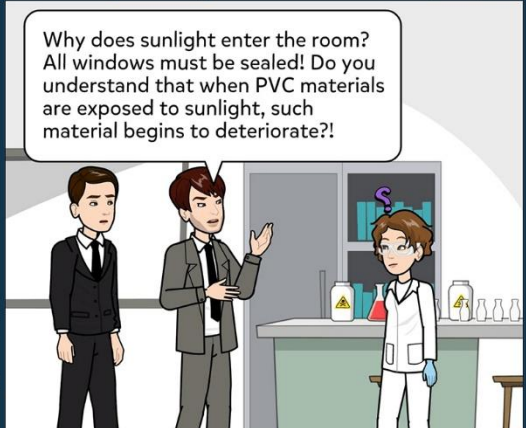
POLYMER

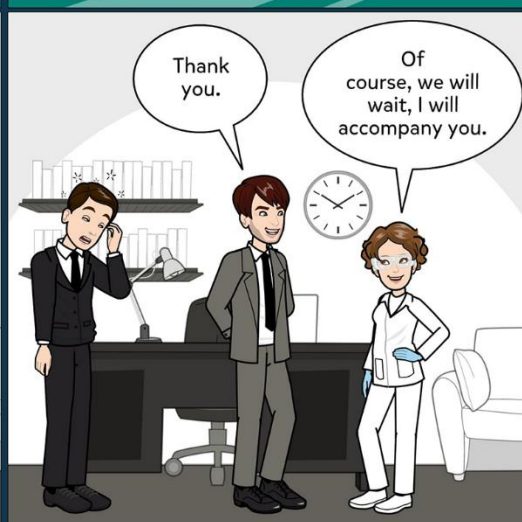
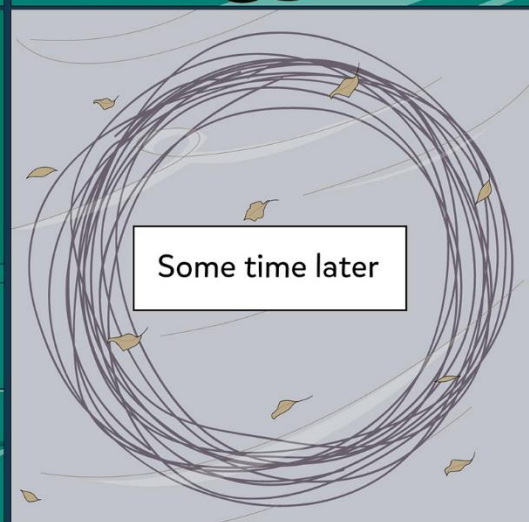
Daria Maltseva, Valeria Safronova

We are now at the building materials factory and are carrying out a scheduled inspection. The occupational health and safety department will check the products and the quality of the workplace. The main task of our mission will be to identify any shortcomings, violations, leaks and releases of hazardous substances into the environment. If such violations are found, we will take all possible measures to ensure that the violators are punished and to help the company solve these problems. If all goes well, we will add the company to the list of the city's best. So let's get started.



Read from right to left

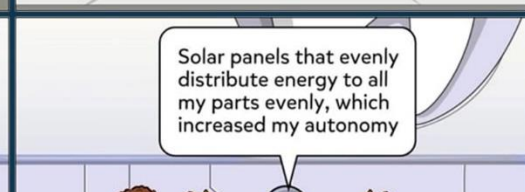
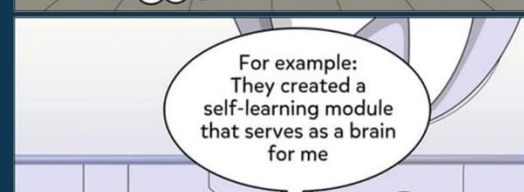
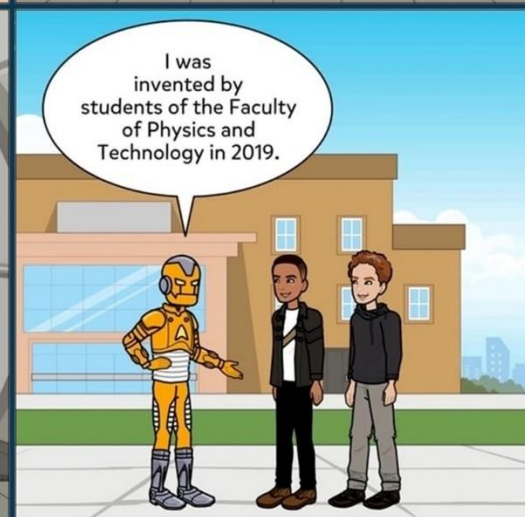
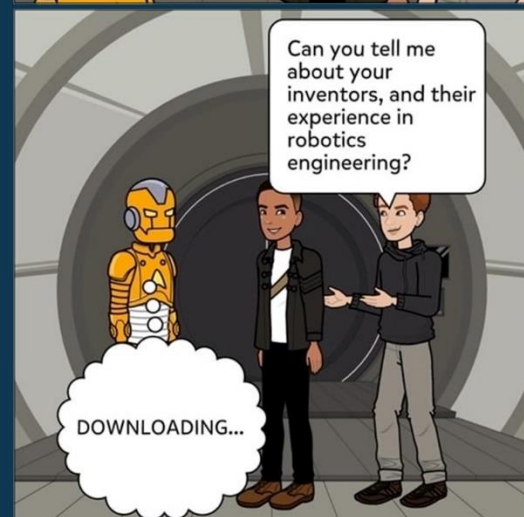


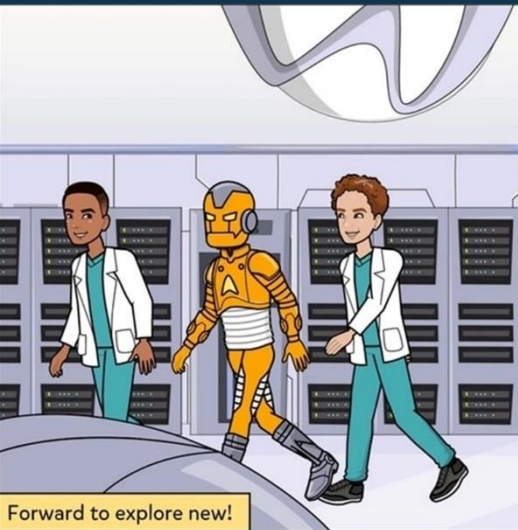




ROBIN

Azamat Nurlanov, Yaroslav Degtev



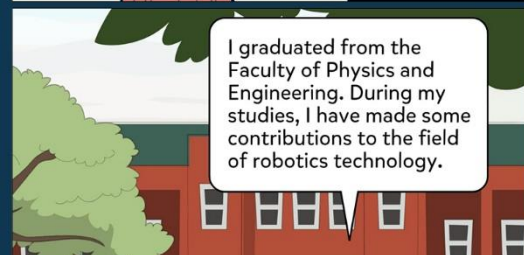
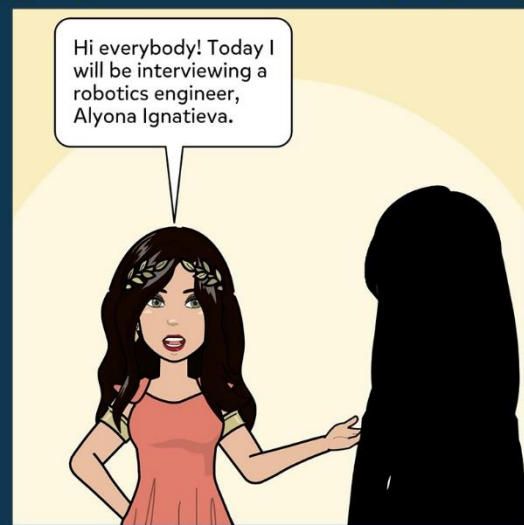


Forward to explore new!



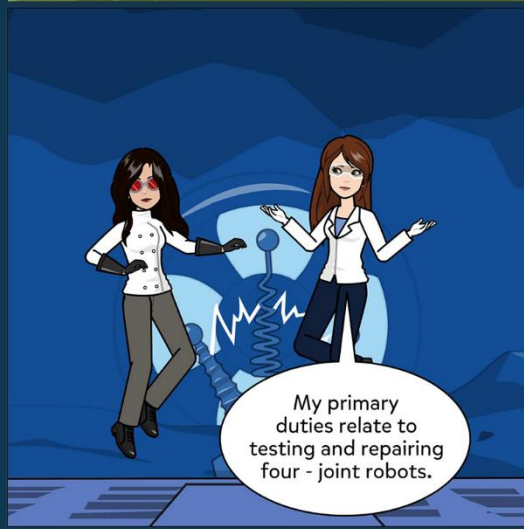
ROBOTS TAKE OVER THE WORLD

Alyona Ignatieva, Lilya Tuktamysheva





When I was doing my internship, I also assisted in the development of a seven - joint manipulator.



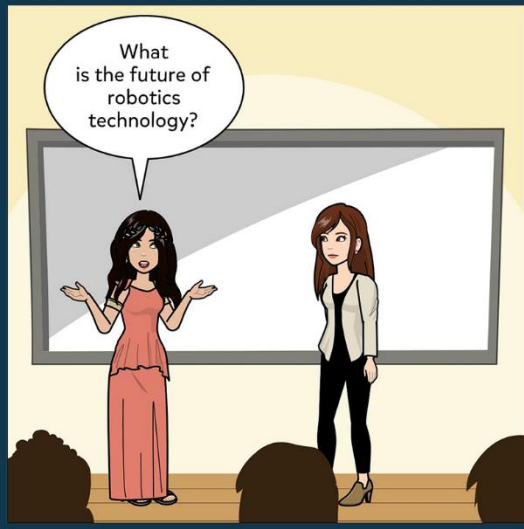
My primary duties relate to testing and repairing four - joint robots.



That's great. What is the most challenging aspect of robotics for you?



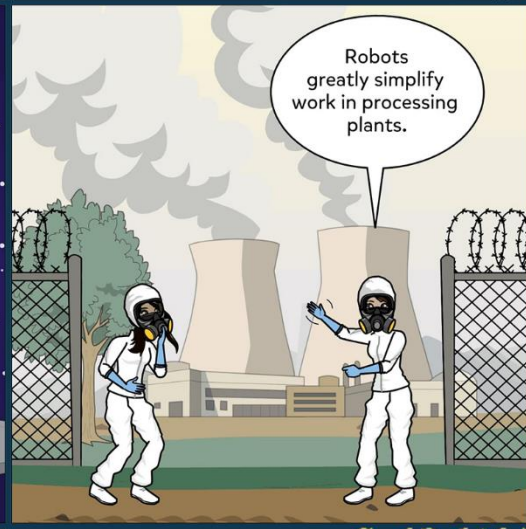
For me, the most challenging aspect is enabling devices. There are many different ways to get energy, and you need to know exactly which one to use.



What is the future of robotics technology?



The field of space exploration is directly related to robotics.



Robots greatly simplify work in processing plants.



And it makes the life of ordinary people more interesting.



Thanks for your narrative! That was exciting!

It was nice talking to you!



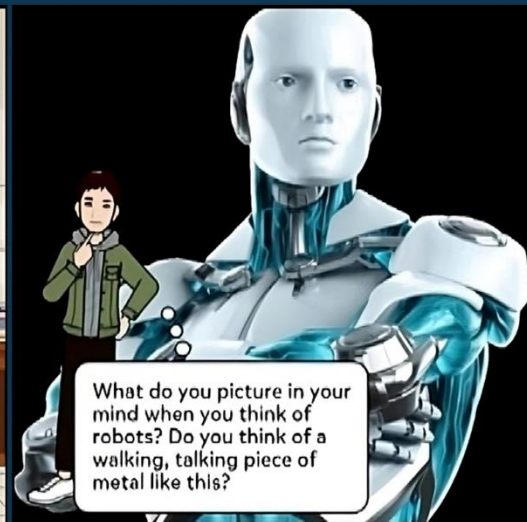
REAL-LIFE ROBOTS

Ibrahim Alyousef, Rodion Galimulin, Elizar Chaykin

hello friends. let me first introduce our team. my name is Ibrahim and these are my friends Elizar and Radion.



in today's lecture we are going to talk about Real-life robots that will make you think the future is now. So let's get started.



What do you picture in your mind when you think of robots? Do you think of a walking, talking piece of metal like this?

A lot of people do, because some robots really do look sort of like people. But despite what you see in the movies, most real-life robots don't look like us. They can look like animals, or like things you've never even seen before.



Robots come in all different shapes and sizes because they all have different jobs to do. And if you're wondering what robots really are and what they can do, don't worry we are gonna explain, what is a robot and how do robots work?



A robot is a machine that's designed by people to do a specific job. And the scientists who design and build robots are called roboticists.



The very first robot was built over 50 years ago to help build cars in a factory.

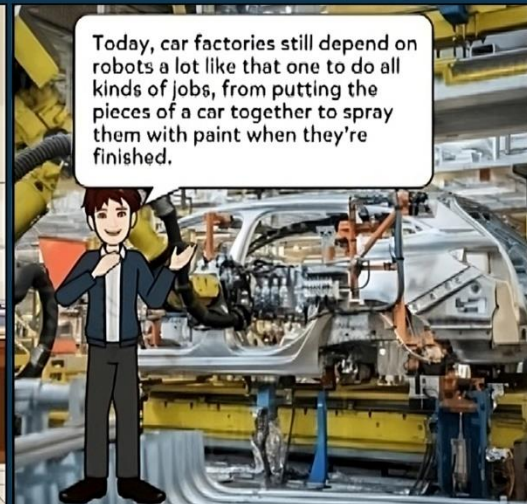


Most robots do jobs that people can't do or don't want to do. If a job is kind of boring, like if it involves doing the same thing over and over, or if a job is very dangerous and it means going places where people could get hurt, then chances are a robot has been built to do it instead.

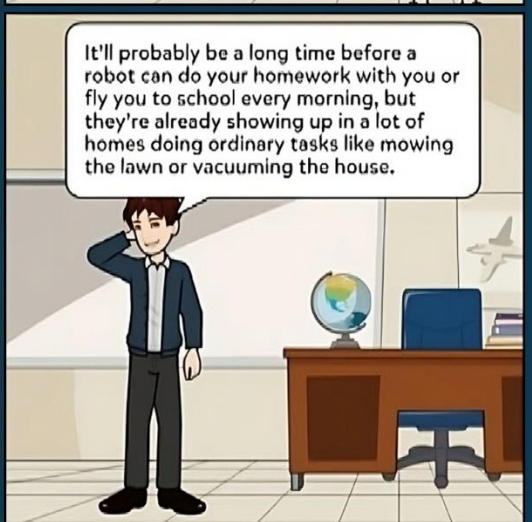
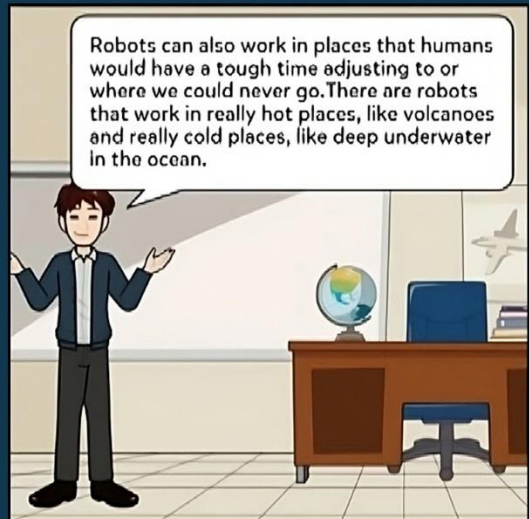
And robots work in lots of other kinds of factory jobs, too, like building computers.

Robots are good at jobs like these because, unlike humans, they're less likely to make mistakes when they're working, and they don't go on vacations or even take lunch

Today, car factories still depend on robots a lot like that one to do all kinds of jobs, from putting the pieces of a car together to spray them with paint when they're finished.



This makes night time jobs the perfect fit for bots. They can do things like control city, train after dark while we



MEETING OF TWO SUPERMINDS

Anton Kulikov and Maksim Tseytler

The meeting

Hello, Maksim. Nice to meet you!

Hi, Anton. Me too

I came to ask you several questions about your research and future career.

Let's go! I'm all ears.

First of all, tell me about topic of your research.

OK! I'm immersed in very interesting theme. It's programming of microcontroller.

Oh, wow! It's amazing!

By all means! Together with our supervisor we learn a lot of unusual things

What is the most interesting thing do you like in your research?

I like programming on Python, but it's tricky. Only smart people can do this.

Sure, it's difficult. I was also interested in doing this.

Wow, cool! Talk to me your experience in robotics engineering.

Well, I'm study a design features of automated and control systems.

Main problem of automation and control relay to mechanical system, automatic perception, navigation and design making system.

That's a good idea! I have no run, so let's meet to discuss next time.

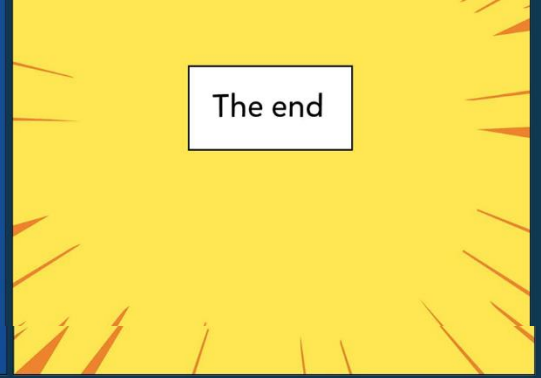
That's sounds great. Maybe we can do a cooperative project?

Bye

OK, I'll write you later. Bye



The end



INFLUENCE OF ROBOTS IN LATER LIFE

Hung Nguyen

Earth, year 4022....



In the future, humans have been completely replaced by robots. Technology helps people not have to do anything even the smallest. Society now depends on machines, humans are just a secondary factor in it



However, the machine gradually lost control and made society into chaos



Meanwhile, Mr. H - the inventor of these technologies, making it difficult for the public to understand while living his life as a recluse



He only knew the truth when his friend came to inform him



Already knew the truth, he decided to go back in time to prevent himself from activating this technology though it helped him get money and fame



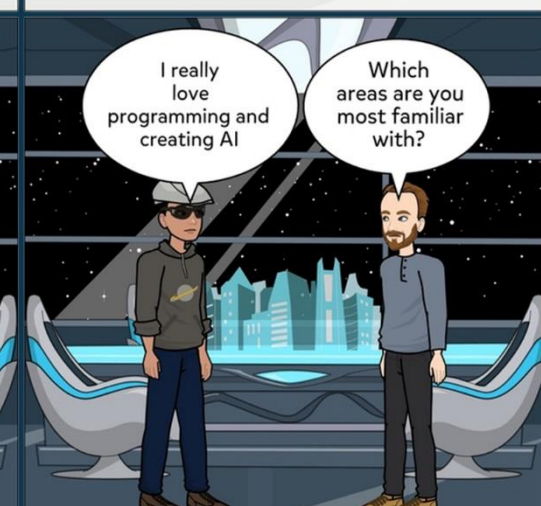
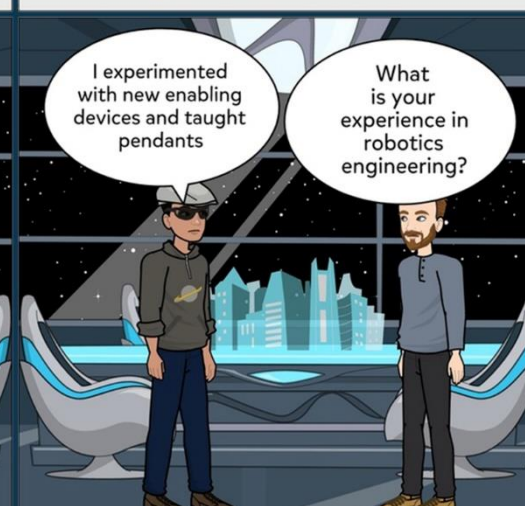
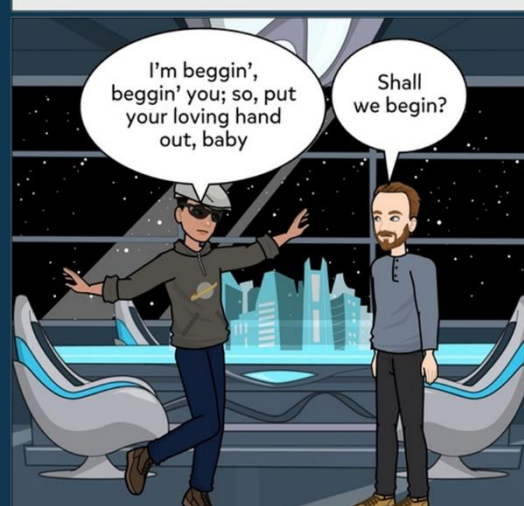
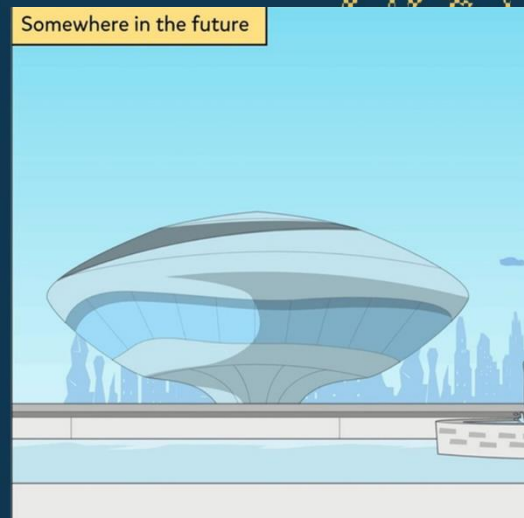


What will happen in the past? Stay tune for more!

HE IS VERY MISTAKEN

Soldatov Yuri, Titarenko Georgy

Somewhere in the future





It was difficult for me to understand the structure of some robots

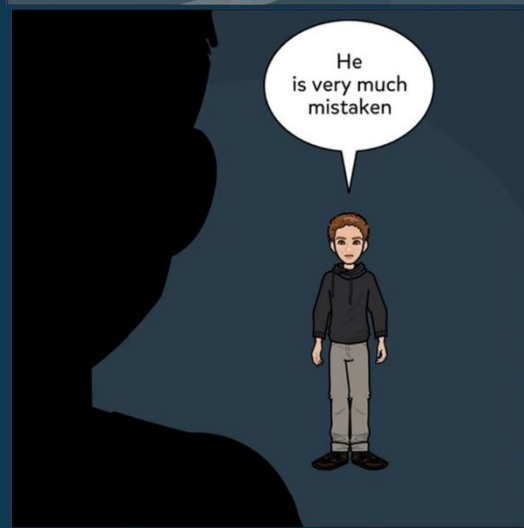
What are you having the most difficulties with?

Okay

A couple more questions about robots

Of course yes, what kind of stupid questions

Is the kettle a robot?



He is very much mistaken



WHERE DO STUDENTS WHO DO NOT LEARN WELL GO

Denis Lee, Dmitry Postnikov



You are arrested for stealing buns.

It happened a few years ago. I was arrested on suspicion of stealing a bun. I was put in prison for 5 years. But I wasn't going to give up.

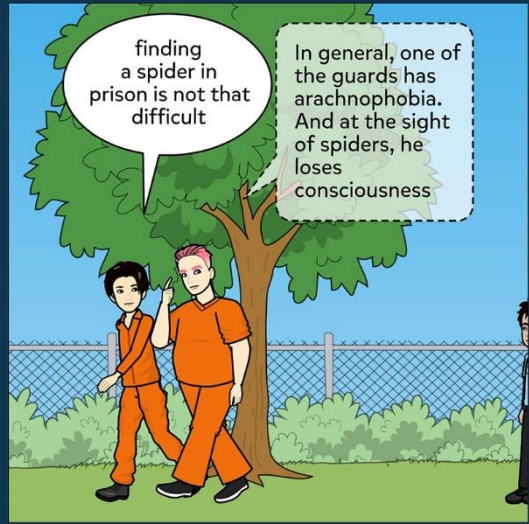


The first day in prison was very unusual, but gradually I began to feel at home



2)Are you Dimon or something?

1)Hello. Denis is that you?



explorations related to robots



in today's lecture we are going to talk about Real-life robots that will make you think the future is now. So let's get started.

ds. let me first
our team. my
brahim and these
friends Elizar and



What do you picture in your mind when you think of robots? Do you think they will be walking, talking metal like this?

Thus Sanya met with his classmates .

Evening in the assistant's hut!



We went to the concert after a short walk around the territory of TSU .

Thanks for your narrative! That was exciting!

It was nice talking to you!