Scholar 381

Chapter 382: Clash Of The Titans

“Of course you can…”

Lu Zhou made a gesture to invite Professor Fefferman to the whiteboard.

Professor Fefferman picked up a marker and stared at the whiteboard for a while. He then started to write.

The lecture was technically over, but not a single person left the lecture hall.

Everyone, including Lu Zhou, stared at the whiteboard.

Lu Zhou looked at what Professor Fefferman was writing, and his eyes gradually lit up.

Box..

Amazing…

This was an interesting part of mathematics.

A method that was unfeasible would never work, no matter how many times one tried.

But once one embarked on a method that might work, one could feel the victory ahead.

Although Fefferman hadn’t finished writing, Lu Zhou was 90% certain that his method was correct.

As expected, this big name didn't let him down.

Professor Fefferman swiftly filled in the rest of the calculation steps and wrote one final line.

[Pμi:= μi – (Δ^-1)·δi·δj·μj]

There was a commotion in the classroom. Although this content was too difficult for undergraduate students, this was still Princeton.

They couldn't think of the method, but they could understand it.

Obviously, their comprehension speed was slower than Lu Zhou's, but just like Lu Zhou, they saw the ingenuity of Professor Fefferman's workings.

Professor Fefferman placed down the marker and carefully read his calculations from beginning to the end. After that, he smiled and said, "This question isn't easy… A bit too difficult for undergraduate students."

Lu Zhou coughed and said, "Hence, it is supposed to be a thought-invoking question."

Lu Zhou only planned to lecture the students. He wouldn't have written his research problem on the whiteboard if there weren't so many students interested.

Lu Zhou definitely didn't expect this big name to sit at the back of the lecture hall.

Professor Fefferman placed his attention back to the contents on the whiteboard and rubbed his chin as he spoke in a thoughtful manner.

"(Δ^-1)·δi·δj is defined as the Fourier multiplier of ξiξj/|ξ|2… But what I want to know is that even if you have derivation equation of Pμi, what is the point? I can't seem to grasp it… Can you explain it to me?"

“Of course,” Lu Zhou smiled and said, “but I’ll need a new whiteboard.”

“Princeton has plenty of whiteboards, I’ll find one for you.”

Professor Fefferman left the lecture hall and came back with a whiteboard.

Lu Zhou erased the writing on the new whiteboard and picked up the marker. He then began to explain while writing.

“If we get Pμi: = μi-(Δ^-1)·δi·δj·μj, we can find the non-diverging property of μ for conventional integration…”

Lu Zhou’s research was only up to the “Pμi:=?” step. Therefore, he was deriving equations on the spot.

This sounded difficult.

But actually, it was very easy.

After all, all he needed to do was to use the new conclusion to continue his train of thought.

However…

[<B(μ,v),w〉 = -πi∫Λξ1,ξ2,ξ3(μ(ξ1),v(ξ2),w(ξ3))…]

Lu Zhou suddenly stopped writing.

Professor Fefferman suddenly looked interested.

Lu Zhou looked back at Fefferman.

“What do you think?”

Professor Fefferman rubbed his index finger on his chin as he said, “It’s… interesting.”

The students stared at the two men standing on the podium silently; they were afraid of interrupting the thought process of the two big names.

There was nowhere else in America that respected knowledge as much as Princeton.

Five minutes passed by before Professor Fefferman suddenly spoke up.

“It seems that this problem isn’t that easy to solve.”

Lu Zhou was still staring at the whiteboard, and he nodded. “You’re right.”

If this problem were easy to solve, the Clay Institute wouldn’t have included it in the Millennium Prize Problems.

“However, I’m surprised you are able to get to this step.” Professor Fefferman said, “The Navier–Stokes equations is an interesting topic; it is the basis of fluid mechanics, but it is also a partial differential equation problem. If someone can find a smooth solution of the equation, not only will it be a glory to the human spirit, it will also have a profound impact on multiple disciplines.”

Dieudonne was one of the founders of the Bourbaki Group, and “Mathematics is the glory of the human spirit” was one of his famous quotes. Professor Fefferman didn’t agree with the views of the Bourbaki Group but he agreed with the quote.

Professor Fefferman smiled and started to clap his hands.

“I think this has been a very fulfilling lecture… although we might not be the best judge of that… What do you think?”

He turned around and looked at the students.

Obviously, a round of applause ensued.

Lu Zhou couldn’t help but smile in the midst of the thunderous applause.

Although he didn’t say anything, he felt pretty proud in his heart.

The sense of accomplishment in a classroom was different than doing a serious report.

It seemed that even though he had barely seen his students, his student still quite liked him.

“Oh yeah, I solved the question,” Professor Fefferman said when he suddenly remembered something. He then pointed at the calculations on the whiteboard and asked, “Do you keep your promise?”

Lu Zhou was stunned.

“Promise?”

The girl with the long maroon hair raised her hand and said, “Professor, you said that whoever solves this problem can become your PhD student.”

The classroom started to jeer playfully.

Lu Zhou coughed and said, “Stop joking around.”

“No, no, I’m not joking,” Professor Fefferman said. He smiled and continued, “If you want, I wouldn’t mind doing another PhD.”

Although Professor Fefferman didn’t sound like he was joking, Lu Zhou thought that he was definitely joking.

Compared with Professor Faltings who had left Princeton, Fefferman was on the other end of the spectrum in terms of arrogance. Only he would make a joke like this.

Seeing that Lu Zhou was confused, Fefferman coughed and spoke in a more serious tone.

“Okay, since you don’t plan on taking in a PhD student, I hope you can do one favor for me.”

Lu Zhou asked, “What favor?”

“It’s about the existence of a smooth Navier-Stokes equation,” Professor Fefferman said with a smile. “I want to work with you on the problem!”

Chapter 384: Invisible Bullets

On the day of the experiment, a thick gloomy cloud covered the town of Princeton, and it looked like it was about to rain.

Lu Zhou went to PPPL, and as he walked in the laboratory corridors, he suddenly felt a little strange.

It was like he wasn’t in a laboratory. Instead, it was almost like he was going to a hospital’s child delivery room.

Lu Zhou thought for a bit and realized that this analogy was kind of correct.

The team of He3 engineers and researchers spent countless days and nights on this seemingly impossible project.

Lu Zhou couldn't even count how many hours he had put into the project.

Box..

It was no exaggeration to say that the He3 atom probe technology was his child.

Lu Zhou walked to the control room and went inside.

The control room was messy; there were wires tangled everywhere, bunched together using plastic ropes. The computer used to control the atomic gun electromagnetic field was in an even worse state as the mainboard and wires of the computer were exposed.

After all, this was all pieced together in a hurry.

The engineers only had to ensure that there was no faulty equipment; it wasn't their responsibility to impress every visitor.

Lu Zhou look around the control room and saw Professor Lazerson.

However, there was a stranger standing next to Professor Lazerson.

When the stranger noticed Lu Zhou, he offered his right hand.

"Hello, Mr. Lu Zhou."

When Professor Lazerson saw Lu Zhou, he introduced his boss to him with great enthusiasm.

“This is the director of the PPPL laboratory, Professor Terrence Brog.”

Lu Zhou looked at this man and shook his hand.

“Hello.”

Lu Zhou had heard of Terrence Brog before.

Last year, the former director of the PPPL, Stewart Prager, caused a US$438 million loss for the US Department of Energy because of the NSTX-U equipment failure. Prager decided to resign and since then, Terrence Brog had taken over the director position at PPPL, thus saving the fusion energy science industry.

After taking over as director, his first course of action was to clean up the mess done by his predecessors and increase scientific research funding.

Impractical projects were cut; if the He3 project team couldn’t show enough potential, they might be cut as well…

Lu Zhou suddenly realized why this guy was here.

Professor Brog looked at Lu Zhou and cleared his throat. He then said with a blank face, “First of all, congratulations for reaching this step.”

Lu Zhou: “Thank you.”

“Don’t thank me, I didn’t do anything. Plus I’m not giving you any good news,” Professor Brog said. He then paused for a second before he said emotionlessly, “If this experiment fails, I will suspend the project. The PPPL researchers are not your personal employees, we can’t waste time on projects without potential.”

Lu Zhou flinched, and he said, “Even though I am willing to provide funding?”

Professor Brog stared at Lu Zhou as he replied, “That’s right.”

There was tension in the air.

Professor Lazerson noticed this and coughed. He wanted to diffuse the tension, and so, he pulled Lu Zhou aside.

Lu Zhou looked at Professor Lazerson and asked, “What is his problem?”

“Maybe…” Professor Lazerson hesitated for a bit before he said in an uncertain tone, “he has his eyes on the US$4 million in the research funding account…”

Although he didn’t want to bad mouth his boss, the situation was apparent.

“US$4 million?” Lu Zhou was stunned. However, he was focused on something else, and he asked, “Why haven’t we spent the US$4 million yet?”

Professor Lazerson nearly choked on his breath.

Haven’t spent the US$4 million?

Why do you sound dissatisfied?

“The US$10 million funding cost was a rough estimate. In fact, the Brookhaven National Laboratory has a good relationship with us. We are perfect buyers of their old equipment. Including the original funding that we had, we only spent an extra US$7 million…”

Professor Lazerson looked suspicious when he said, “The problem is the remaining funds in the research account. You know, although we seem well funded, this technology is difficult to commercialize in the short term. The Congress budget committee hasn’t been happy with us…”

Lu Zhou asked, “What does this have to do with me?”

Professor Lazerson said with a serious tone, “Of course it does! If this project is killed, then the money can be moved onto another project with more potential.”

Lu Zhou couldn’t help but curse in his heart.

“They can do this?”

“Who knew that you would send the money over so quickly,” Professor Lazerson said. He then looked away as he continued, “The original agreement we signed clarified the money as a donation. Therefore, we are at an advantage here… But all this doesn’t matter… We just have to successfully do the experiment.”

No one could touch the He3 research funding account, as long as the project wasn’t killed. Although this wasn’t ethical, it was part of scientific research.

However, just like what Professor Lazerson said, talking about this didn’t matter.

If their project didn’t produce results, even without the US$4 million in research funding, Professor Brog would still kill the project.

After all, PPPL had many projects with a higher potential; they couldn’t spend all their resources on one project even if the project was fully funded.

Professor Brog was the person in charge, so he had to think of the big picture.

Therefore, the He3 research team needed a win to prove themselves!

…

After a short meeting, Professor Lazerson announced the beginning of the experiment.

Everyone was in their respective work stations as held their breath.

They were afraid that their breathing would disturb the plasma and helium-3 particle in the vacuum chamber.

Once everything was ready, Professor Lazerson didn’t say anything. Instead, he merely looked at Lu Zhou.

Lu Zhou didn’t speak either. He only gave him a thumbs up.

Professor Lazerson understood Lu Zhou’s intention, and after taking a deep breath, he then pressed the button.

All the work was complete.

All they had to do now…

Was pray.

The liquid helium was poured into the orbit track and the ultra-low temperature conductor gradually reached its critical superconducting temperature.

The instant the orbit temperature reached superconducting critical temperature, the current in the coil began to rise. This was to prepare for the high-speed helium-3 atom.

The moment the signal 1 light lit up, the speed of the helium-3 atom reached its limit and the atomic gun was “loaded”.

This was all like loading a gun— crisp and quick.

Professor Lazerson looked at Lu Zhou again.

Lu Zhou nodded without speaking.

This time, it was Lu Zhou’s turn.

Lu Zhou took a deep breath and walked to the computer. He then pressed the second button, which was the final button.

It was like a trigger was pulled; the helium-3 atom orbiting in the track suddenly broke away from the acceleration orbit and launched in a tangent line into the inner track.

There were no sounds.

No effects could be seen.

However, the moment the atomic gun fired the helium-3 atom, the helium-3 atom was like a bullet that carried a huge amount of energy as it smashed into the hot plasma.

The electromagnetic wave detector showed a series of waves.

Everything happened in an instant, but it felt like it took forever.

At this moment, whether it was Lu Zhou, Professor Lazerson, Professor Brog, or other researchers in the laboratory, they all held their breath for half a second.

The helium-3 atom nucleus penetrated the plasma and quietly slammed into the target material.

A faint wave fluctuation was captured by the probe behind the target material, and the impact data was sent to the computer.

It was like time had suddenly stopped flowing.

Then, the laboratory burst into celebration.

Professor Lazerson threw his hat into the air and waved his fist in the air.

“We did it! We did it!”

Chapter 385: Mathematics Is Difficult

Translator: Henyee Translations Editor: Henyee Translations

Success!

The voice of celebration was wonderful.

At this moment, the countless blood, sweat, and tears spent on this project were all worth it. The doubts that the PPPL higher-ups had on this project vanished.

Lu Zhou looked at the flashing signal light and loosened his fists. Due to the adrenaline in his heart, he tightened his fists again.

The experiment wasn’t finished.

After the first successful attempt, then came the second, and the third…

Box..

The helium-3 particles were accelerated to the limit of kinetic energy before it penetrated the plasma and crashed into the tungsten-titanium target material.

The series of data was collected, wrangled, and imported into the database in a standard format which was soon to be analyzed by theoretical researchers.

Professor Lazerson looked at the computer screen as he patted Lu Zhou's arm.

On the other hand, Director Brog was standing in the jubilant crowd. He stared blankly at the data on the screen and didn't say anything.

"What did I tell you," Professor Lazerson said as he walked to Director Brog with a smile. He patted his shoulder and said, "I told you this is feasible! You must believe us now."

Brog came back to life and coughed heavily before he said, "It's only an in-progress result, this is still too early to tell."

"Yes, yes, only in-progress result." Professor Lazerson smiled and joked, "Don't be jealous when I stand on the podium in Stockholm."

"Talk when you actually win the Nobel Prize."

Director Brog stayed silent for a while before he walked toward Lu Zhou.

He then stood next to the young scholar and sighed before he spoke in an apologetic tone.

"For the things that I said before… I have to apologize to you."

Although Lu Zhou was a bit pissed off at Director Brog's words, the moment the helium-3 particle hit the target material, all of his anger was diluted by the joy of success.

"There's nothing to apologize for, you did what you were supposed to do," Lu Zhou said as he looked at the data on the computer screen. He then said in a relaxing voice, "Just like how we're doing what we're supposed to do."

"Thanks for your understanding… I sincerely wish you all the best."

Director Brog was grateful. He then left the laboratory without mentioning anything about killing the project.

If the He3 atom probe technology was commercialized, all of the major plasma physics laboratories around the world would be able to "observe" instead of "estimate" the plasma at a high temperature.

Observing and estimating were two completely different things.

This was without a doubt a Nobel Prize-level kind of breakthrough!

If Director Brog really killed this project, although no one would blame him, he would regret it for the rest of his life…

…

On the same day, after Lu Zhou ate his dinner, he walked to Lake Carnegie for his nightly run around the lake path.

His run was euphoric, and he couldn't help but run faster.

In the end, he ran as fast as he could; it was like he was a horse in the wild.

The only thing that calmed his emotions was the cold wind blowing onto his face.

Although the system's medication improved his metabolic function, it didn't make him an athlete.

After sprinting around the walking path for less than five minutes, Lu Zhou stopped by a bench at the park. Panting, he grabbed the armrest before slowly sitting down.

His sweat was dripping down his back and stuck to his sports attire, and the cold wind was piercing through his bones.

The freezing cold made Lu Zhou sneeze, but it didn't put out the fire in his heart.

Suddenly, Molina, who was jogging around the lake, noticed Lu Zhou sitting on the bench. She slowed down and walked up to the bench.

Molina looked at him weirdly as she asked, "… Are you having a mental breakdown or something?"

"Nope, I'm feeling better than ever," Lu Zhou said while holding his kneecaps with his hands. He then forced out a smile to show that he was fine.

In fact, Lu Zhou was too happy.

Molina looked at him like he was crazy and didn't say anything. Instead, she sat down on the other end of the bench.

She took out a bottle of water from her running belt and took a sip of water elegantly. She then looked at Lu Zhou, who was still panting, and asked, "It's nearly Christmas, do you have any plans?"

"I'll probably spend it in Princeton. My students want to have a party, then…" Lu Zhou thought for a bit and couldn't think of any better plans, so he said, "Then, I'll rest at home."

Molina was speechless as she stared at Lu Zhou. She then sighed and said, “That’s kind of sad… You don’t plan on finding a girlfriend to spend the holiday together?”

Are you just rubbing it in my face?

However, Lu Zhou didn’t care. After all, he was used to it.

“Mathematics is difficult enough, I’ll deal with females some other time.” Lu Zhou suddenly remembered something and he looked at Molina before he asked, “I almost forgot, aren’t you single as well?”

“I’m not the same, I’m a voluntarily celibate; emotions are a burden for me.” She shook her sweaty blonde hair gently and said, “As you said, mathematics is difficult enough.”

Lu Zhou was amused when he heard this.

“But I haven’t seen any mathematics achievements from you.”

Since knowing Molina, Lu Zhou went from an undergraduate student to a professor, but Molina was still studying under her mentor who was attempting to solve the impossible Riemann’s conjecture. Molina hadn’t even written her PhD thesis yet.

Of course, Lu Zhou wasn’t gloating. In fact, it was the contrary. He had persuaded her many times to choose an easier target.

Obviously, she had never listened to his advice.

Molina looked at him angrily.

She wanted to make a comeback but found out that she had nothing on him.

“You just wait… I’ll make you regret saying that next year at the IMO conference!”

She then stood up and ran away.

“I’ll wait for your good news.”

Lu Zhou shook his head and smiled.

Who’s having a mental breakdown?

But then again, if a mental breakdown can create achievements, then maybe it’s not so bad.

Lu Zhou wiped the sweat off his forehead. He then stood up and began to slowly run along the walking path again…

Chapter 387: The Most Beautiful Snowstorm

Things suddenly got a bit awkward.

The telephone line went silent.

In the end, it was Shi Shang who broke this silence.

“This is an international call, the fees are very expensive.”

Oh…

Box..

Then let’s talk a bit longer.

Lu Zhou was speechless, he decided to stay silent.

F*ck sake!

I’m spending Christmas alone, and now this asshole is shoving it in my face!

Outrageous!

Shi Shang was anxious; he spoke in a worried tone.

“Zhou, say something! Are you still here?”

Lu Zhou listened to Shi Shang screaming for a while. He then sighed and said, “I’m here, my phone lagged… Have you guys gotten the certificate?”

Shi Shang replied, “We have.”

Lu Zhou asked, “With who?”

Shi Shang: “Ya Jing… No shit, who else could it be?”

Lu Zhou said, “Ya Jing? She’s the same year as you, right? She’s still doing her master’s?”

They were the class of 2013, although many people left the school in March and April, they only officially graduate in July.

Therefore, Wang Jingya was only a first-year master's student.

"Marrying in your first year of master's study, is that good?"

When Shi Shang heard this question, he felt a bit awkward. He then coughed and said, "This… There's a bit of a situation."

The moment Lu Zhou heard his hesitant voice, he instantly knew what was going on.

I guess he wasn't being safe when doing naughty things…

Lu Zhou didn't know why but he felt like gloating.

Shi Shang didn't notice how Lu Zhou felt, and he continued, "Zhou, honestly, sometimes I think fate is a magical thing. When I was with her, I never thought we would make it to this day… But now, I found out that when the moment came, I… Sorry, I don't know how to describe this feeling."

Shi Shang, who was usually the most articulate, was at a loss for words.

Lu Zhou went silent for a while before he sighed and said, "… It seems like you really love her."

"Yes, I love her more than I love myself." Shi Shang blew his nose and suddenly had a serious demeanor as he said, "Wedding's on January 20th at the Jinling Purple Mountain Hotel. Your bro's missing a best man, are you coming?"

Lu Zhou laughed.

"No shit, I'm coming!"

There was no point in asking this question.

Lu Zhou would be back in China in January; even if he wasn't, he would fly back.

Even though he would be insanely jealous at the wedding, he would still be going.

"Good!"

Shi Shang was moved by Lu Zhou's answer.

However, Shi Shang had a problem. Whenever he was moved, he would get too philosophical.

"Oh yeah, Zhou, no offense, but hurry up and find a girlfriend. I know mathematics is your life, but you should know that there's more to the world than mathematics. Tagore once said, 'love is when the soul starts to sing' and…"

Ah…

I accidentally hung up the phone!

Lu Zhou pretended as if nothing had happened and threw his phone on the sofa. He continued to read his thesis.

Since all of his phone calls tonight were cursed, he didn't want to pick up another call!

…

The Princeton Institute for Advanced Study was jolly festive on Christmas day.

Most people here were considered geniuses, but they were still people. Professors or doctors… They were just their academic qualifications.

Actually, because they were geniuses, they knew how to party and have fun better than normal people.

Dean Goddard was usually a serious person, but today, he was wearing a red hat and a fake white beard, dressing up as Santa Claus. He stood around and handed out small booklets to people while everyone responded with a hesitant smile.

Under his orders, the chefs in the dining area on the first floor were wearing festive costumes and were serving Christmas special meals.

Not only that, but the No. 1 lecture hall was also emptied for a live-action “Star Wars” play.

Star Wars was basically American culture in a nutshell.

The script for this live-action play was adapted by the professors in the School of Social Sciences and the School of History. Therefore, it had a classic European historical influence.

However, Lu Zhou was more interested in the lecture hall than Star Wars.

Because it was in this lecture hall that he announced the Goldbach’s proof to the mathematics world.

A year later, he was standing here again.

But he wasn’t here as a report presenter, but rather a guest star on the live stage. He played the part of a soldier who was killed by a lightsaber; his only line was “Ah!”.

And his “opponent” was Molina.

Lu Zhou highly suspected that this woman deliberately arranged the script to be this way so as to make it an opportunity for “revenge”.

All of the actors were having a good time and so was the audience.

What was interesting was that the two mathematics professors sitting in the front row were having a serious discussion on the science behind Star Wars.

Professor Deligne stared at the dazzling “lightsaber” and said, “This is not realistic at all, they’re clearly in the Space Age, but they’re still using swords.”

Professor Fefferman smiled as he retorted, “No one knows what physics is like outside of the solar system, we only know what it should look like.”

Witten, who was a diehard Star Wars fan, would’ve loved to join in on the conversation.

However, at this moment, he was acting on stage.

After the live-action ended, people began to enjoy the festival in their own way.

For example, chess.

Or dancing to the music.

Regardless, everyone was exchanging Christmas presents.

“Oh, why is it a football again? I’ve already gotten five footballs,” Hardy said while holding the football. He then asked, “Do you think that all Brazilians like football?”

Qin Yue smiled. “I don’t know what else to give you.”

“It’s fine, I don’t mind having another football, thank you for your gift,” Hardy smiled, showing his bright teeth. He gave Qin Yue a nicely wrapped gift box and said, “This is my gift to you.”

Qin Yue shook the box and couldn’t guess what it is. He then asked, “What is this thing?”

Hardy smiled. “Table tennis ball.”

Qin Yue: “…”

Hardy didn’t care about Qin Yue’s reaction. He had a box of chocolates in his hand as he looked around.

“Speaking of which, where is Vera? I haven’t seen her.”

Qin Yue sighed and said, “Did you forget? We planned on telling the professor about the thing.”

Hardy was suddenly unhappy.

“Wait a minute, didn’t we say we’d tell him together?”

Hardy was looking forward to Professor Lu’s reaction. Now that his friend was the one giving the news, his victory was stolen.

Qin Yue suddenly looked a bit weird.

“… The situation has changed, I think it’s best if Vera tells the professor herself.”

Although Qin Yue was introverted, that didn’t mean he wasn’t observant. He could tell from how Vera looked at Professor Lu, and he knew that it wasn’t just admiration.

“Oh, she’s getting the entire spotlight then,” Hardy complained. “We contributed as well, but how come she’s the only one that’ll get a compliment from the professor…”

Qin Yue: “…”

What the hell is a compliment?!

You’re not in primary school anymore…

Qin Yue always knew that his friend was slightly brain-damaged, but now it seemed that it wasn’t just his brain, his soul was also damaged.

Qin Yue coughed and explained it briefly.

“Ok, stop complaining, 70% of the work is done by her. I don’t care if you like it or not, she has the right to do this.”

Hardy looked dissatisfied.

“Do you support her?”

Qin Yue shrugged and said, “I always support Professor Lu.”

While the two were talking, Lu Zhou, who finished his act on stage, walked out of the backstage room.

He bumped into Vera.

The little girl looked like she had something to say so Lu Zhou spoke first.

“Is there something you want to say?”

Vera nodded and said quietly, “Can… you come with me?”

Lu Zhou said, “Christmas present?”

Vera nervously nodded. “Yes!”

Lu Zhou looked at the nervous girl and smiled.

“Then please lead the way.”

Lu Zhou followed Vera and walked down the corridor.

They walked for a while, and Lu Zhou couldn’t help but ask curiously.

“What secret gift is this?”

Vera shook her head and didn’t say anything.

Finally, the two arrived in an empty classroom.

Lu Zhou looked at the closed door and felt a bit strange.

“Can I go in?”

“Ok!”

Vera nodded.

Lu Zhou reached down for the doorknob.

However, the second he stepped into the classroom, he was shocked.

There were ten blackboards in front of him.

Lines upon lines of neatly written formula occupied the blackboard; its mathematical beauty attracted Lu Zhou's eyes.

Time slowly passed by.

The snow fluttered outside the windows, cruising in the cold, blistering wind.

It was like the white snow was landing on the blackboards.

Lu Zhou stared at the blackboards for more than half an hour.

He suddenly burst into a smile.

"Thank you.

"This is definitely the most… beautiful thing I've seen this year."

Chapter 388: Proof Of The Collatz Conjecture

When Vera heard Lu Zhou's praise, she smiled brightly.

This was undoubtedly the best compliment she had ever been given.

As she stood next to Lu Zhou, she said in a low voice, “Your guess is correct, Collatz conjecture is a number theory problem. It’s also a complex analysis problem…”

In as early as 1994, L.Berg and G.Meinardus proved that the 3n+1 conjecture was equivalent to the function equation h(z3) = h(z^6)+{h(z2)+λh(λz2)+λ2h(λ2z2)}/3z (where λ=e^(2πi/3)). This could be expressed through the unit disc {z:|z|<1} as h(z)=h0+h1z/(1−z) (where h0 and h2 are complex constants).

In 1998, D.Schliecher used this foundation to prove that any integral function in the form of h(z) results in g(z) = z/2 + (1-cos(πz)(z+1/2)/2+1/π(1/2-cos(πz)sin(πz)+h(z)sin^2(πz)).

Vera used these two conclusions to construct a wonderful transcendental integral function. She proved that both g(z) and Φ(g) contained a positive integer, such that for branch D, there was z0∈D, by which {g^ok(z0)}∞/k=1 converged to 1.

Box..

The Collatz conjecture was established by inference!

“Excellent proof…” Lu Zhou smiled happily as he said from the bottom of his heart, “I’m amazed.”

He met Vera in the summer of 2016; it was now the end of 2017.

Lu Zhou was happy to see his student’s progress.

He was also happy to see that the Group Structure Method he used to solve the Goldbach’s conjecture was applied by his own students.

He now knew exactly what kind of “joy” the high tech system was talking about.

“This is all thanks to your guidance,” Vera said humbly. Her eyes were full of gratitude as she looked at her professor.

Although the proof process was completed by her, the proof idea was provided by Lu Zhou.

Ever since her in-progress report at Berkeley at the beginning of the year, she had been working with Hardy and Qin Yue on the final proof. All of this work was based on Lu Zhou’s idea.

Vera was the one that completed most of the work. Therefore, she knew better than anyone how important Lu Zhou’s proof idea was.

Lu Zhou smiled. “You don’t have to be humble. I only suggested a direction, but you’re the one that ran to the finish line.”

He paused for a second before continuing, “I suggest you submit the thesis to Annual Mathematics, but the editors are on vacation these days. So, you can post it on arXiv first… Maybe the editors of Annual Mathematics will notice your thesis before the end of their holidays.”

Posting the thesis on arXiv could prevent someone else from posting a similar thesis first. However, this didn’t matter too much. The Collatz conjecture was popular in the ’80s and ’90s, but these days, it wasn’t a trending topic at all. The chance of a similar thesis was almost zero.

Of course, Lu Zhou made this suggestion with his own benefits in mind.

Using the inferences he made when he solved the Goldbach’s conjecture, the system’s deciding factor of when the mission was completed was when the thesis was released to the public.

If the thesis was posted on arXiv, then his mission would be completed.

When Vera heard Lu Zhou’s advice, she nodded her head seriously.

“I understand, I’ll do that right now.”

Lu Zhou smiled and said, “Okay then, I’ll help you erase the blackboards… Thank you for the gift.”

The moment Vera heard Lu Zhou’s praise, she smiled.

After a while, she suddenly lowered her head and blushed.

“Professor.”

Lu Zhou: “What?”

She gave herself some courage and looked up at Lu Zhou.

“Can… I ask you for a wish?”

“I’m not Santa, I can’t put your gifts in a sock next to your bedside table,” Lu Zhou joked. He then paused for a second before adding, “But, as long as it’s not a violation of any principles, I’ll do anything to help you.”

“I’m…”

Vera opened her small mouth.

However, she suddenly realized that her wish might cause trouble for him.

The words were at the tip of her tongue, but she couldn’t say it out loud.

“I… want to do a PhD under you.”

Lu Zhou smiled. “I welcome you! I’ll be offended if you choose another supervisor.”

Vera felt a little more comfortable and a gentle smile appeared on her face.

She was disappointed at herself for not having enough courage.

However, she had gained a lot of courage over the past two years…

But, it still wasn’t enough.

…

Lu Zhou spent the day hanging around the Princeton Institute for Advanced Study. He then returned to his home while carrying all of the gifts from his colleagues and students.

The gifts weren’t extravagant; they were less than US$30. However, they were meaningful.

As for his gifts to his students, he gave them the pens that he had collected at conferences from all over the world.

The gifts weren’t expensive, but they were memorable.

Lu Zhou put the gifts away and sat on the sofa by the fireplace. He then closed his eyes and went into the system space.

As he walked in front of the translucent holographic panel, he suddenly saw two lines of text floating in front of him.

[A. “Research on the even coherent state of a q-distorted harmonic oscillator in a finite-dimensional Hilbert space.”

Student: Wei Wen.

Student engagement: 25%.

Type of experience: Mathematics, Physics.]

[B. Collatz conjecture.

Student: Vera, Hardy, Qin Yue.

Student engagement: 70%.

Type of experience: Mathematics.]

Before Lu Zhou got home, Vera already uploaded the thesis to arXiv and satisfied the system's mission conditions. Therefore, the Collatz conjecture was posted on the mission panel.

Lu Zhou didn't know how the system determined whether a person was his student, but the system was quite accurate.

Not just that, but the system could even calculate the proportion of the student's work participation.

"Is this a multiple-choice question?"

Lu Zhou looked at the two options on the screen and crossed his arms.

According to the system mission description, he could choose one thesis as a mission submission.

The total amount of subject experience reward was based on the academic value of the thesis multiplied by the coefficient of the student's participation in the thesis.

It was obvious that the system wanted him to nurture genius students who could do their own research. Therefore, the system required him to avoid direct participation in the thesis.

Actually, Lu Zhou had been trying to be more "hands-off".

However, even with his hands-off attempts, the system rated his contribution as 30%.

Because in the beginning, he developed a clear research direction for them and developed a framework for the entire research project.

His students followed his research direction and completed the proof.

Lu Zhou thought that the system would allow this, but now it seemed that he was too optimistic.

"It really doesn't want me to help at all."

Lu Zhou looked at the translucent screen and shook his head.

When he reached out and selected "B", a pop-up came out. He then selected "Confirm".

After that, a wave of blue light swept through the information screen, and a line of text appeared.

[Congratulations, User, for mission completion!]

Chapter 390: Plans Before China

Lu Zhou's flight to China was after Christmas.

He had three days before his flight, and he planned to run some errands. This was to prevent him from being swamped when he returned back to Princeton after the break.

The first matter he had to deal with was the “existence of a smooth solution to three-dimensional incompressible Navier-Stokes equation” research project.

Other than the plasma turbulence phenomenon, this was Lu Zhou’s most important research project.

There had only been one discussion meeting ever since the “NS research project group” was established.

The next day, Lu Zhou went to Nassau Hall to hand in his holiday application. He then went to the Department of Mathematics building at Princeton University where he found Professor Fefferman’s office.

Box..

When he arrived, Professor Fefferman was talking about next month’s American Mathematical Society Conference with his students.

When Professor Fefferman saw Lu Zhou holding a holiday application in his hand, he smiled.

“You plan on returning to China?”

Lu Zhou replied, “Yeah, instead of Christmas, Chinese New Year is my real holiday. I’ll probably come back around mid-February.”

Professor Fefferman nodded and casually said, “You really do need a break to relax. Very few scholars work themselves to the bone in so many research projects in such a short amount of time.”

“Working to the bone?” Lu Zhou shook his head and said, “I don’t feel that way at all. After all, research is a fun and interesting thing.”

“I thought the same when I was young,” Professor Fefferman smiled and said, “but I found out that no matter how interesting the mathematics problem is, moderation is key.”

Lu Zhou said, “… That’s because you’ve already received all of the honors you could possibly get.”

Earlier this year, the Wolf Prize Foundation announced the winner’s list, and the most important award was given to Professor Fefferman.

The Wolf Prize was regarded as the ultimate mathematics award. It was mainly given to mathematicians over 40 years old for their long-standing contribution to the mathematics community.

Fefferman was the youngest person ever to receive the Fields Medal, and now, he had the ultimate mature mathematician award. There wasn’t another mathematics award he could aim for.

“What do you mean? No amount of awards is enough, plus I’m still missing an Abel Prize,” Professor Fefferman said. He then smiled as he continued, “In short, go enjoy your life. I won’t send you any emails until February.”

Lu Zhou asked, “What about the Navier–Stokes equation?”

Professor Fefferman said, “We’ll talk about that in a month.”

When Lu Zhou saw that Fefferman didn’t budge, he shrugged.

“Okay, if you insist.”

…

Other than Professor Fefferman and Lu Zhou's collaboration project, Lu Zhou's Collatz conjecture project also came to an end.

Perhaps it was because of Lu Zhou's influence or because of the Collatz conjecture's popularity, the thesis on arXiv attracted a lot of attention.

Many people referred to the Collatz conjecture as another "victory application" of the Group Structure Method.

What surprised people the most was that instead of Lu Zhou, it was his students who applied the method.

It was the morning of the 27th, one day until Lu Zhou's flight.

Lu Zhou sat in his office at the Institute for Advanced Study while he read Vera's thesis.

Although he had read the entire proof process, as their supervisor, Lu Zhou still had to review every single detail before they could officially submit the thesis.

Also, he had to determine the thesis authors.

Normally, the names of the three students would be listed according to their respective contributions.

As for Lu Zhou, he would be the fourth and corresponding thesis author.

Of course, as their supervisor, he had the right to claim the results as his own. However, he would never compromise his integrity like this.

Normally, a supervisor wouldn't be willing to give the thesis results to their students, but Lu Zhou didn't care.

The Collatz conjecture wasn't worth anything to Lu Zhou.

Even if Lu Zhou claimed it, it would only be the icing on the cake.

In addition to the author list, this type of collaborative theses would also indicate exactly what each author did. Most research institutes cared about this part more than the author ranking order.

However, Lu Zhou noticed that Vera didn't list out each author's contributions. Instead, she wrote, "These authors contributed equally to this work" and left the section at that.

Adding this sentence to the thesis meant that every author contributed equally and everyone was integral to the thesis.

This also meant that all of the authors in the thesis would be considered equally ranked.

"Is it fine?" Lu Zhou read the thesis in its entirety before he looked at Vera and said, "This isn't fair for you."

Although Lu Zhou hadn't directly participated in the project, he had been keeping up with the progress of the project.

For example, he would have a weekly discussion meeting whenever he was at Princeton, and he would carefully read the in-progress reports.

It was no exaggeration to say that Vera was responsible for 70% of the research project, while Hardy and Qin Yue was only responsible for the remaining 30%.

Vera shook her head. "I just like to research these problems. As for who contributed more… I don't think it matters."

"If you really think that way, then I'll respect your decision." Lu Zhou didn't try to persuade her.

Qin Yue put in a lot of effort; Hardy, not so much. However, Vera was willing to give them equal amounts of credit, and so, Lu Zhou didn't pursue the matter.

At most, Lu Zhou felt a little pity for Vera.

Lu Zhou paused for a second and placed the thesis on the table as he continued to speak to Vera.

"According to the original agreement, I will help you guys apply for graduation. You'll receive the diploma in three to four months. If you plan on studying a PhD under me, it's best to apply as soon as possible so that I can accept your application."

Lu Zhou was well aware of his student's abilities; interviewing them would be a piece of cake.

Vera nodded seriously.

"Okay, I understand!"