proudly presents

SPECTRA
IN
HIGH INTENSITY

BY REBECCA THOMPSON, Ph.D. & DAVID ELLIS
**Lucinda Hene a.k.a. Spectra**

Our heroine. She mysteriously developed laser superpowers around the time she entered Tesla Junior High and has been saving the town, and the world, ever since. Regular student and star swimmer most of the time, when it counts she can turn into a laser and save the day.

**Kas**

Lead guitarist of garage band “The Ultraviolet Catastrophe” and Spectra’s biggest fan. His greatest ambition is to go on tour with OneRepublic and rock out all over the world.

**Ruby**

Lucy’s best friend since 2nd grade, Ruby has an eye for fashion. When she’s not redecorating her room she can be found behind the lens of her camera. She has always loved science, particularly astronomy.

**Gordy**

He’s a star on and off the field. The starting quarterback for the Tesla Junior High Chargers and straight A student, Gordy can always keep his head and come up with a plan.

**Ms. Pauli Black**

Owner and proprietor of Black Body Repair auto body shop, she is also known as the Quantum Mechanic. She is fantastic at fixing a car and is also learning to control her quantum mechanical powers. Read Spectra’s Quantum Leap to find out more about what she can do.

**Miss Alignment**

Perennial villain Miss Alignment sees herself as the mastermind of evil. The world sees her slightly differently, but she is still determined to rule the town. Thwarted by Spectra and her gang in “Spectra’s Power” she is intent on coming out on top in...
ON THE OUTSKIRTS OF TOWN STANDS THE DREADED BOSE-EINSTEIN CONDENSED PENITENCIARY. KNOWN FOR ITS FRIGID CONDITIONS, SOLITARY CONFINEMENT, AND HARSH WARDEN, B. PHILIPS, IT IS HOME TO THE MOST HARDENED CRIMINALS.

A PRISON IS ONLY AS GOOD AS ITS LOCKS, AND BEC PEN CURRENTLY HAS A FAULTY ONE.

UNFORTUNATELY, THEY MAY HAVE CALLED IN EXACTLY THE WRONG LOCKSMITH TO FIX IT.

YOU KNOW THE DEAL. DON'T TALK TO THEM. IT ONLY RILES THEM UP.

WATCH OUT FOR YOUR COFFEE. THIS ONE COULD DROWN YOU WITH IT.*

THIS ONE OVER HERE IS NOISY, BUT CAN'T REALLY HURT YOU.

SEE SPECTRA #5, "TURBULENT TIMES."
Fools! Can't hurt you?!
If you only knew! I am the nefarious Miss Alignment!
I'll run this town one day!

My misaligner B9 would have shut down the entire world!
If only that laser girl and her friends hadn't stopped me!
Next time will be different! I'll...

Sure you will and I'm Mr. Universe.

You nail 'em, we jail 'em.

Okay, the broken lock is this way. We need it operational ASAP.
We're getting a new batch of inmates tomorrow.

I hope this doesn't take long. "Days of Our Lives" is on in an hour.

Yeah, yeah. Just stop. We've heard it all before.

She sounds high maintenance.

She sounds high maintenance.

I hope this doesn't take long. "Days of Our Lives" is on in an hour.

I'm sure you will. And I'm Mr. Universe.

Yeah, yeah. Just stop. We've heard it all before.

She sounds high maintenance.

She sounds high maintenance.

I hope this doesn't take long. "Days of Our Lives" is on in an hour.

I hope this doesn't take long. "Days of Our Lives" is on in an hour.

Don't worry...

It won't take long. In fact...

"We'll be outta here --

-- before you know it."
"Still needs some modifications. I've been practicing on toy trucks like you suggested."

"I have to go find out what those kids are up to. Is the listening device ready?"

"Yes, with new headphones."

"How's my lens clamp coming? Is the lens in working order?"

"Still trying to get the magnifier the right size and still working on the audio."

"Are the visual and audio projectors ready? I need to let this town know I'm in charge!"

"I will rule this place and make sure the town knows the power of Miss Alignment! Those kids will pay and the town will be mine!"

"Yes, you will rule this town. But it's still going to take a week or so for this to be finished. You'll have to be okay with ruling this cave 'til then."
Hey, Ruby. Are you headed over to Black Body Repair after school?

I want to but I can’t. I have swim practice. At least the new coach hasn’t tried to kill us yet.

Quiet year... so far.

Yeah. Ms. Black and I have been restoring this old VW. I’m helping her control her powers and she’s letting me redo the inside as an art project. I don’t think she likes the shag carpet much, but I think it really adds something.

Right, Gordy?

Quiet year... so far.

The energy of light depends on the wavelength. Shorter waves, like ultraviolet have more energy than longer ones, like red.

Hey! Will there ever be a class where the general doesn’t embarrass us?

You’d think after saving him from his lab he’d be more grateful.*

How’s Ms. Black doing, anyway?

She’s getting really good at splitting herself between two places and she can hop from one place to another, she just doesn’t always end up where she means to.*

Hey! The general is going to yell again!

The speed of light is... Ms. Hene, stop talking!

The speed of light is... Ms. Hene, stop talking!

Ugh! Will there ever be a class where the general doesn’t embarrass us?

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Power? Two places at once? I need to hear more about this. This could be a problem.

Why didn’t I know about this?!?

*See Spectra #3, “Spectra’s Force.”

*See Spectra #6, “Spectra’s Quantum Leap” for more about Ms. Black.
I only put up with him because he’s family. That’s no good, lazy…

Reigh didn’t tell me anything!

WHERE ARE YOU GUYS HEADED? I HAVE PRACTICE LATER. I’M HOPING TO MAKE STARTING QUARTERBACK THIS SEASON.

I’m off to practice, too, and Ruby’s headed to the garage. Meet for pizza later?

Nice shirt, Kas! Ruby’s headed over to the garage, wanna go with? I’m headed to swim practice.

Can’t. Band practice. We have a gig this weekend. You’re coming, right, Lucy?

Meet for pizza later?

Yeah!

Darn Reigh and his faulty equipment! Now I’ll need another way to listen to them at the garage.

Hey, Lucy! I really like your hair like that!

Sounds good!

I had no idea this town had so many people with science powers. I have to find out more. I can’t lose again!

I didn’t tell him anything!
I know you aren’t a huge fan of the purple carpet with the yellow car, but this combo was all over New York Fashion Week.

Wow! You are getting really good at being in two places at once.

I am happy that you are happy with it.

Why thank you, Ruby. I have been practicing a bit. Though I do very much wish I could control in which places I am.

I am still having quite a bit of trouble remaining in the locations I desire. I feel unfocussed.

However, I have been controlling my momentum much better. I am good at knowing how fast I am but not where I am.

I must now endeavor to know where I am but not how fast I am going. There seems to be a delicate balance between the two.

Sounds complicated. Where's the red paint, silver glitter, and super glue?

We interrupt this broadcast with a special alert...
Against all logic, inept villain, Miss Alignment, has escaped from Bose-Einstein condensed penitentiary. It is assumed someone left her cell unlocked as that is the only way she could have escaped. Be on the lookout for a woman in a dated silver unitard and ill-fitting bell bottom pants with very big hair.

Listen to that! My escape plan was so ingenious they don't even know it was me!

And what does he mean "ill-fitting"?! I spent hours in the prison gym. I make these pants look good!

Oh no! We have to warn Lucy! I can't believe she's still wearing those pants.

Clang!

Aarghh!
I’ll text the gang to meet us here and figure out what to do.

I shall try to pull myself together and be ready for their arrival.

Stop! Put down that phone!!!

This is a no texting zone!

You aren’t going anywhere! I have you trapped!

It appears that you have tried to incapacitate us with silly streamers.

I do not believe this is structurally sound enough to hold us.

They are pretty colors, though.
It doesn’t matter how silly the streamers are, it’s slowed you down just enough.

You’re coming with me, assuming Reign installed my booster rockets correctly.

**Miss Black, do you think you can be in three places at once? You need to tell Lucy, Gordy, and Kas to come to the garage.**

LUCY’s at the pool, Gordy is on the field, and Kas is with his band.

Miss Black, do you think you can be in three places at once? You need to tell Lucy, Gordy, and Kas to come to the garage.

Where... where did she go? Is this the “superpower” you were talking about? Tell me!

Looks like one of us got away.

Now! Know why you wear those bell bottoms—
to hide your booster rockets.

Go ahead...

“Make fun all you want. These booster rockets are taking you with me.”

“Hurry!!”

Yes, Ruby, I think I have the ability to do that if I focus very hard. I shall tell them now.

Miss Black, do you think you can be in three places at once? You need to tell Lucy, Gordy, and Kas to come to the garage.

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Yes, Ruby, I think I have the ability to do that if I focus very hard. I shall tell them now.
Meanwhile, across town...

Miss Alignment recently broke out of prison. She has--

Taken Ruby to some evil lair. We all must--

Meet back at Black Body Repair to determine how to rescue Ruby.

I do not know where they went. She bound us with silly streamers and then flew off, taking Ruby with her.

I have no more information.

Hey, guys--

There are tons of places where she could hide. Video arcade, stadium, library--

Guys, seriously. Listen--

Hey! I think I know where she is!

Hey, Gordy is right. She could be anywhere. How do we start narrowing this down? What would make the most sense?

Check it. It’s not like she built a new ‘evil lair’ while she was in prison. Let’s head up to her old place. We’ve been there often enough.

It’s still totally tricked out. She probably even put the sign back up.

AND SOON...
A SHORT TIME LATER...

SCORE! I WAS RIGHT!

Yes. It seems you were correct in your assumption. She has indeed returned to her previous evil lair!

GREAT JOB, KAS. BUT WE DON'T HAVE A PLAN TO RESCUE RUBY. HOW ARE WE GOING TO GET IN THERE AND SAVE HER? I CAN'T TURN INVISIBLE.

NO, BUT I CAN! REMEMBER MY LASER POWERS, GUYS? TURNING INFRARED MAKES ME IMPOSSIBLE FOR HUMAN EYES TO SEE.

THERE SHE IS! IS SHE TIED UP WITH SILLY STREAMERS? MISS ALIGNMENT ISN'T EVEN MAKING THIS A CHALLENGE.

WHO'S THAT GUY?

WE'RE DOING PRETTY WELL HERE. SHOULD BE READY IN A FEW DAYS. I STILL NEED TO RIG UP THE MAGNIFYING PROJECTOR AND ADJUST THE LENS CONTROLS.

WE'RE AIMING AT THE LIBRARY, NOT CITY HALL RIGHT NOW.

REMEMBER, WE HAVE TO DO THIS AT EXACTLY THE RIGHT TIME FOR THE SUN TO BE IN THE RIGHT SPOT.

I KNOW, I KNOW. YOU'VE SAID ALL THIS BEFORE. QUIT TALKING AND GET A MOVE ON.

YOU HEAR THAT, GIRL? IT DOESN'T MATTER IF YOUR FRIENDS SAVE YOU. IN A FEW DAYS THE TOWN WILL BE MINE!

YOU CAN TRY, BUT WE HAVE LASER POWERS AND QUANTUM MECHANICS ON OUR SIDE.

YOU HAVE A TARP, A CRYSTAL BALL, AND QUESTIONABLE DECORATING TASTE.
WHY IS IT TAKING SO LONG?!
I THOUGHT YOU HAD IT ALMOST ALL DONE. IT CAN'T BE THAT COMPLICATED.
LIGHTHOUSES HAVE BEEN DOING THIS SINCE 1823. I WANT TO DO IT NOW!

LOOK, DO YOU WANT IT DONE NOW OR DO YOU WANT IT DONE RIGHT?
IT HAS TO BE AT EXACTLY THE RIGHT ANGLE IN EXACTLY THE RIGHT SPOT. A FEW DEGREES OFF AND WE JUST LOOK LIKE FOOLS WITH A STRANGE ROOF ORNAMENT. CHILL!

WE MUST HURRY!
THOSE KIDS HAVE A TENDENCY TO RUIN MY PLANS. BUT NOT THIS TIME!

I'M GUESSING THAT'S YOU, LUCY, AND NOT COMBUSTABLE SILLY STREAMERS?

WHAT'S THAT SMELL?

YEP! I'M BUSTING YOU OUTTA HERE.

AARGHH!

WE'RE OUTTA HERE. GRAB ON.
You got her!

Ruby did a lot of recon while tied up with silly streamers. Let’s head back to Black Body Repair and figure out a plan.

Silly streamers?

Soon...

Let me make sure I am correctly hearing you --

There was a large illustration of City Hall, photographs of melted trucks and several artistic lighthouse prints?

Yep, that about sums it up. What on earth could she be up to? What do they have in common?

The only thing I ever thought magnifying glasses were good for was melting plastic army men.

Kas! You’re a genius!

You are! Did you see those pictures of melting trucks and lenses? I bet she’s going to try and destroy the town with a giant lens. Just like those army men.

Think about it. A super strong regular lens would be crazy heavy. She’s using lighthouse technology, a.k.a. a Fresnel lens. Those are light-weight, thin and really powerful. Light as a feather, strong as an ox.

But why the lighthouses and City Hall? They make great photos but what do they have to do with anything?

And she’s probably focusing sunlight on City Hall.

As Ruby told Miss Alignment, we have some wicked powers, serious smarts, and a big time creativity. I think I have an idea.

Ms. Black, can you find plans to the city and a whole lot of iron?
I am very glad I was able to find the required amount of iron. That was exceptionally problematic.

Yeah, but it went pretty quickly. Laser powers rock!

I completely agree. Though I still wish we had time to paint it. Green would have matched the trees very nicely.

Yeah -- someone want to explain why city halls looks like a bird cage?

3 days, 2 nights, 6 pizzas and 4 cases of soda later....

Kas, you’re great, but your memory could use some work.

Yeah -- someone want to explain why city halls looks like a bird cage?

Miss alignment is going to try to use a fresnel lens to melt city hall. Remember? You made us realize back at the garage.

When the focused rays from the sun hit the statue on city hall, they will heat up the statue.

That will heat up the building which will catch on fire.

By connecting the statue to iron rods and connecting those rods to the iron pipes under the city, we can direct the heat away from the building.

When you cook with an iron skillet it takes awhile to heat up your hand. It’s the same thing here. Only the building is your hand.

Let’s hope it gives us enough time. Glad those kids told us when she was going to attack.
I am so glad that your laser powers allowed us to weld the iron so quickly. The heat conductance you discussed would work more effectively if we could fully cover city hall with iron --

But I did not possess that much.

What's that?!

Looks like we finished just in time!

Quiver in fear before me!

Miss alignment has returned!
YOU STOPPED ME ONCE, BUT YOU CANNOT STOP ME AGAIN!

YOU SURE THIS IS LOUD ENOUGH?

YEAH, I’M SURE EVEN PERTH IS QUIVERING IN FEAR.

IN JUST A FEW MINUTES THE SUN WILL BE PERFECTLY ALIGNED TO BURN YOUR TOWN TO THE GROUND!

SPECTRA! SURRENDER AND I WILL BE MERCIFUL!

BUT IF YOU DO NOT, YOU WILL LIVE WITH THE GUILT OF CAUSING YOUR TOWN’S DESTRUCTION!
"IT'S WORKING! REIGH
YOU ARE NOT COMPLETELY
INCOMPETENT! THE LENS
ANGLE IS PERFECT!"

"LOOK AT THE
STATUE MELT! CITY
HALL WILL BURN!"

"MUAHAHAHAHA"

OUR SYSTEM IS WORKING!
IT'S ABSORBING THE HEAT FROM
THE FOCUSED SUNLIGHT AND
THE STATUE. BUT IT CAN'T
LAST FOREVER.

I HAVE TO DESTROY
THAT LENS! I NEED
SOME SERIOUS
ENERGY!

UV, HERE
I COME!
Okay, who's got some food?

Uh... not sure how I feel about those energy bars, Gordy.

Trust me. The berry flavor is delish!

Um...

Nom, you were right! Nom! Nom!

I got this!

Almost there...

High energy laser powers achieved!

Miss alignment, you are going down!
I can do this! I just need to melt the lens. Plastic vs. laser, plastic doesn’t stand a chance.

If I’m gonna do it...

I might as well do it with some style.

What?!! It’s not working! Reigh! What did you screw up? Make it work again!

Freeze!

What is this?! How in the world? Reigh!

Hey there! Looks like we got you!

It’s nice having a laser powered friend. She got us here real quick.

Sorry, Cuz. They showed up in a flash.
Not so fast. You're not getting away again!

Really? Looks like we just did.

We've got somewhere real special for you this time. Every heard of the Quantum Dot Spot? It's going to be a bit confining.

Watch your back! No one ruins my reputation and gets away with it!

I'll always reflect badly on you.

You meddling kids! You can't do this to me again!

Nice job, Lucy, I mean Spectra. Though next time you go Ultraviolet throw us some sunblock first?

Sorry about the sunburn. Hope you can still play your gig tonight. I can't wait to say "Yeah, I'm with the band."

THE END
FOLLOW THE REAL LIFE SCIENCE ADVENTURES OF THE PHYSICS CENTRAL CREW AT physicscentral.com
Praise for the series

"SPECTRA offers a perfect blend of real physics, middle school, and superhero adventure, a combination you probably didn’t even realize was missing from your life. Once you know it exists, though, it’s irresistible."

Chad Orzel, Physics Professor at Union College and author of Eureka! Discovering your Inner Scientist

"I liked Spectra’s superpowers. They were amazing and she’s really cool!"

Nina Parker, 9, daughter of plasma physicist Dr. Carolyn Kuranz

"Reading SPECTRA comics will teach you everything you need to be a scientific researcher! First, she displays a mastery of the laws of Nature. Second, she demonstrates her creative problem solving skills, and third, she knows how to rock a pair of sunglasses!"

James Kakalios, Physics Professor at the University of Minnesota and author of The Physics of Superheroes