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#2

MARCH 2010

SPECTRA

THE ORIGINAL
LASER SUPERHERO



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ILLUSTRATED BY KERRY G. JOHNSON



POWER!

SIX MONTHS HAVE PASSED SINCE LUCINDA HENE LEARNED ABOUT HER LASER POWERS. IN THE LAST ISSUE, SHE USED THOSE POWERS AS SPECTRA, TO RESCUE HER FRIENDS FROM THE CLUTCHES OF THE EVIL MISS ALIGNMENT. SINCE THAT "INCIDENT," THE GANG HAS HAD MANY OCCASIONS TO HAVE FUN WITH HER POWERS. BUT WHEN SHE'S NOT OUT SAVING THE WORLD, LUCINDA STILL HAS TO TAKE TIME TO STUDY FOR HER MIDTERM EXAMS WITH HER FRIENDS.

Miss Allen, or I guess "Miss Alignment," may be a crazy supervillain, but she sure does make physics interesting. If only she wasn't trying to take over the world!

Lucy, knock it off and come help us! Not only are your parents laser jocks, you ARE a "laser," so get down here and help us study!

Hmm, important things to know about light. Let's see, first, light can diffract and interfere...
... so when it passes through small slits, it interacts with itself and makes a bunch of spots.

Gordy, you're right about that. I learned more about diffraction and interference when I battled Miss Alignment to save your butts!

Okay, we said "THANK YOU"! If I don't ace this test, I can't play in Friday's game!

And if I don't get at least a "B," I will not be able to play with my band at the pep rally! So come down here and help us study.

FINALLY! Kas, Did you ever decide on a name for your band?

Yeah... we're "Resonance!"

Sweet!

Kas and Gordy! You aren't going to play on the field or in the band if we keep getting distracted by "Laser Girl" knocking things over!

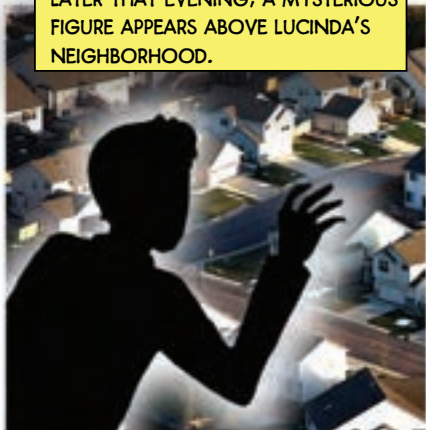
Very funny! And it's "SPECTRA!"

Okay then, "Spectra," answer this question. Do different colors of light have different energy?

Hmm ...



LATER THAT EVENING, A MYSTERIOUS FIGURE APPEARS ABOVE LUCINDA'S NEIGHBORHOOD.



WHAT! Who are you? How did you get in my room?

Lucinda, I'm sorry that I startled you! I'm Irnee D'Haenens.*

I've read about you in my physics textbook. How is this possible? Am I dreaming?

Well... it's something like that.

*Irnee D'Haenens (1934 -2007) was a physicist who assisted Ted Maiman in making the first laser.

I have the powers of a laser so you better stand back!

Calm down. I already know that you're a living "laser"! I'm here to help and teach you about those special powers.

Whatcha talking about? I know how to use my powers! Do you want to try me! I actually know all about the laser!

Oh really? From the looks of the damage to this room, it's pretty obvious that you can't control your powers.

For example, do you know who invented the laser?

Change and put on your Spectra gear. Let's take a short trip back in history.

Okay, I'm ready! Where are we going?

Perhaps if you really understood the history behind the laser, you wouldn't waste your powerful gift on trivial things

I read that a guy named Theodore Maiman demonstrated the first laser in 1960.

True, but do you really think he did it all by himself? Many people were involved in the creation of the laser, including me.

You'll see. Just hold on!

SPECTRA AND IRNEE TRAVEL BACK IN TIME AND REAPPEAR IN THE LAB OF AMERICAN PHYSICIST THEODORE MAIMAN.



Don't worry, he can't see or hear us.



What just happened? Where are we?

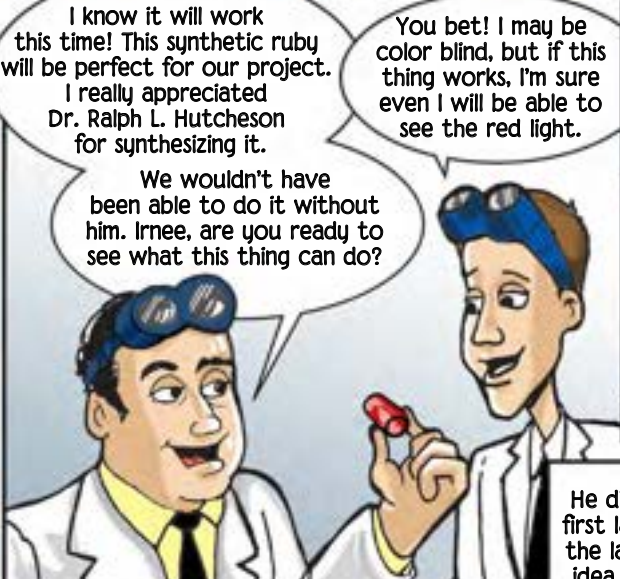
We're back in 1960. This is Theodore Maiman's laboratory.



Is that you with Maiman? Were you there?



Yes, I was there and I saw the first laser light. Let's listen. Something special's about to happen.



I know it will work this time! This synthetic ruby will be perfect for our project. I really appreciated Dr. Ralph L. Hutcheson for synthesizing it.

We wouldn't have been able to do it without him. Irnee, are you ready to see what this thing can do?

You bet! I may be color blind, but if this thing works, I'm sure even I will be able to see the red light.



Stand back! 3.. 2.. 1!

He didn't. He just made the first laser. But HOW to make the laser was someone else's idea. Actually, there's a lot of debate about whose idea it was. Let me explain.



And it was the first time that I saw the color red!

And it was made with a ruby. Just like my ex-BFF Ruby. But I'm doing fine without her.



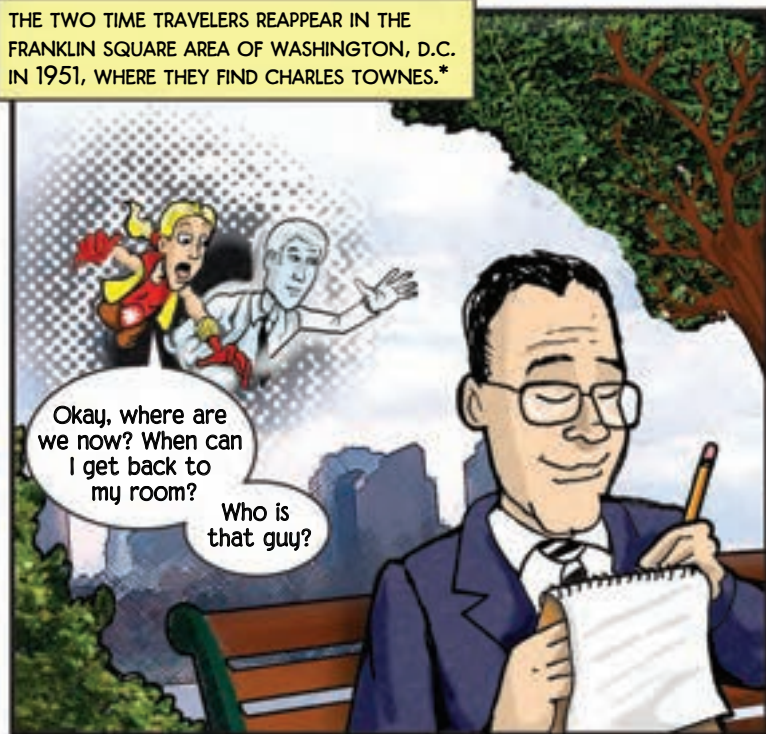
Sure you are. I'm glad to hear it.

Here's another question for you. Where do you think the idea for the laser came from? Do you think Maiman came up with it all by himself?

Uhhmm.... I don't know.



THE TWO TIME TRAVELERS REAPPEAR IN THE FRANKLIN SQUARE AREA OF WASHINGTON, D.C. IN 1951, WHERE THEY FIND CHARLES TOWNES.*



Okay, where are we now? When can I get back to my room?

Who is that guy?



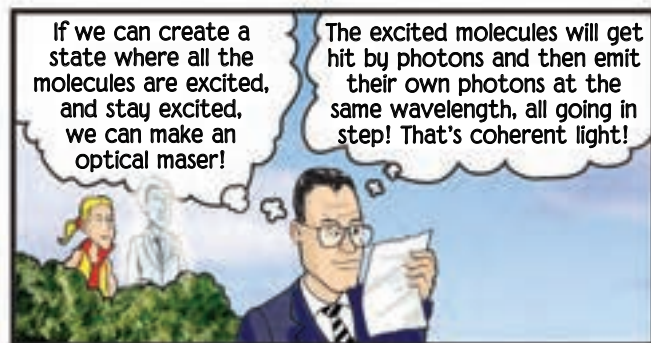
That's Charles Townes.

Wow! I read about him.

Great! Now keep watching. This is important!

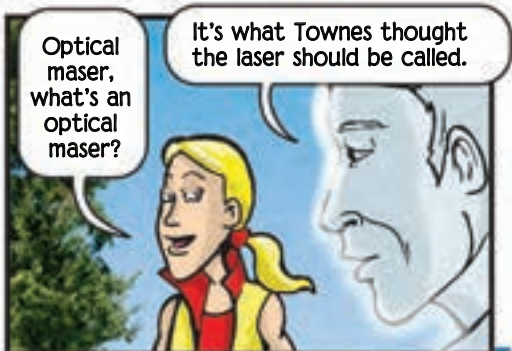
That's it!

* CHARLES TOWNES, J.P. GORDON AND H.J. ZEIGER ARE CREDITED WITH DEVELOPING THE FIRST MASER, THE PRECURSOR TO THE LASER.



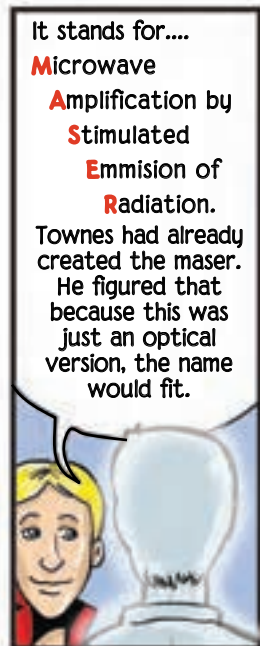
If we can create a state where all the molecules are excited, and stay excited, we can make an optical maser!

The excited molecules will get hit by photons and then emit their own photons at the same wavelength, all going in step! That's coherent light!



Optical maser, what's an optical maser?

It's what Townes thought the laser should be called.



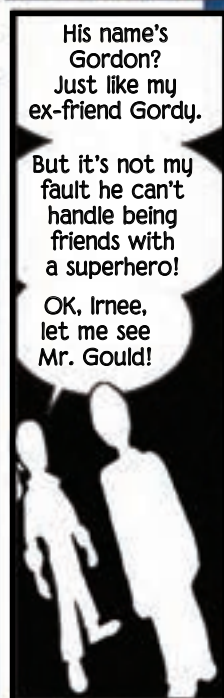
It stands for....
Microwave
Amplification by
Stimulated
Emission of
Radiation.
Townes had already created the maser. He figured that because this was just an optical version, the name would fit.



Well, that's kinda long and clunky. Guess that's why he picked "laser" instead.

Except, he didn't.

Would you like to see who did? He's Gordon Gould, and he's the most controversial figure in laser history!



His name's Gordon? Just like my ex-friend Gordy.

But it's not my fault he can't handle being friends with a superhero!

OK, Irnee, let me see Mr. Gould!



?!?!

SPECTRA AND IRNEE SOON ARRIVE AT THE HOME OF SCIENTIST, GORDON GOULD.



* IN 1957, GORDON GOULD USED A DEVICE WITH MIRRORS THAT TRAPPED AND ISOLATED A SINGLE WAVELENGTH OF LIGHT. HE ALSO WAS THE FIRST PERSON TO USE THE TERM "LASER".

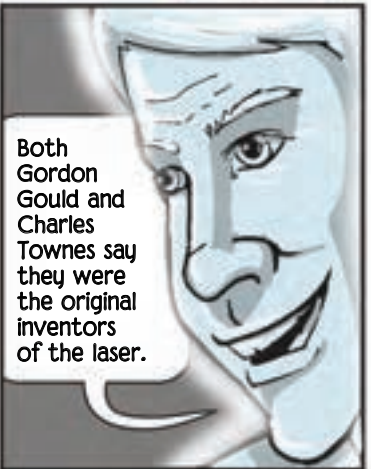
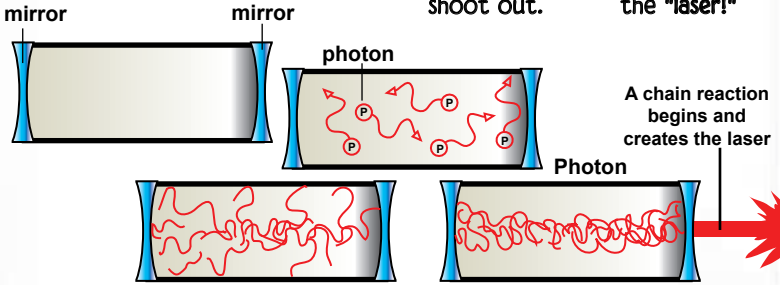


We can put potassium in a cavity with mirrors on each end!

Then excite the potassium and let it relax and give off photons.

The photons will bounce back and forth between the mirrors and cause more photons to shoot out.

It's just like the maser, only with light. I'll call it the "laser!"



They did work down the hall from each other. History has said that Townes did it first, but we don't call it the optical maser.

Are you beginning to see how many people were involved in the laser? No one person can do everything. You have to work together with colleagues and friends.



Well, maybe in science, but I can still save the world without my unappreciative former friends. In fact, I think Ruby, Gordy and Kas are jealous of my new super powers.

I'm sorry to hear that you still feel that way.

Whoa, look at the time. I have to get you back. You do have school.



SWEET! It's about time!

WHILE SPECTRA AND IRNEE TRAVEL BACK TO PRESENT DAY, DOWN NEAR THE CITY DOCK AREA, WE FIND THE NOTORIOUS...

MISS ALIGNMENT



It's finally built! The machine that will let me rule the world!

For years I've labored away, developing laser technology the world can't live without, from DVD players to checkout scanners, to eye surgery to iPods!®

Heck, without my work, the Internet would not exist! Without the things I helped to develop, the world would have come to a screeching halt!

But still, no one respects my talents and phenomenal brain power!

But very soon the world will experience the power of my super laser captivator, the "MisAligner59!"

After I activate my machine, all the lasers around the world will malfunction!

2010
LASERFEST

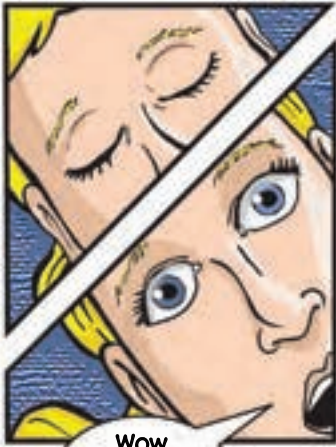
Within every laser-powered device on the planet, there's an undetectable computer chip that will be under my control when it receives a signal from the MisAligner59!

As soon as I have enough power to activate it, the world will feel like it's back in 1959 before the laser was invented!

Project SPECTRA

All I need is the energy from that so-called superhero Spectra. But I need her in her blue form for her to be energetic enough. Now how do I trap her? Ahhhh I think I know....

PRESENT DAY



Wow, that was a weird dream!



Hhmm... but why am I in my costume?



The more that I think about yesterday, I was pretty rude to my "BFFs!" I REALLY do need them to be part of my life!

So one-by-one, Lucinda humbly calls Ruby, then Kas, and lastly Gordy to apologize. Everybody accepts. The crew's back together!

THE RECONNECTED FRIENDS LATER MEET UP AT THE PIZZA JOINT, WITHOUT KAS.



Lucy, did you ever figure out what Miss Alignment wanted from you?

Ruby, I've wondered about that. But I have no idea what she wants.

Don't worry about Miss A. You know if she tries anything, we've got your back!

I just got a text from Kas. He thought we were supposed to meet at the mall. He's there waiting for us. C'mon let's go.

AS THEY HEAD OUT, LUCINDA GETS DISTRACTED.



Hey Lucy! WATCH OUT! You're about to walk into that pole!

Huh??!



SLIZZ!

No need to worry folks! Lucinda is just trying out for a new reality TV show about being a teen sextuplet.

Yeah, sure that's right.

Guys, thanks for the quick cover up!

Do you remember that experiment at school where we measured the width of a hair with a laser?

I guess I could use myself to measure the width of that pole!

SHE PHASES BACK INTO A SINGLE LUCY

C'mon, let's head to the mall!

Yeah, let's split!

Ha! Ha! Ha!

AS THE TRIO HEADS TO THE MALL, GORDY SEES SOMETHING SCURRY ACROSS HIS FEET.

What's that?!!

OMG! It's an iguana! What are you doing here, boy? He has a collar, so he must belong to someone.

Don't touch it! It may have rabies!

Well, I don't see anyone. I'll just take him home and post something on FaceBook. If no one replies, I'll keep him.

!!!!

WHILE THEY'RE DISTRACTED WITH THE LIZARD, A DARK LIMOUSINE PULLS ALONGSIDE THEM. A WOMAN ROLLS DOWN THE WINDOW AND GESTURES FOR THE TEENS TO COME OVER.

Gordy, I guess you didn't pay attention last week in biology class. Only mammals can get rabies!

Skish!



Oh thank goodness, you found "Jiggles!"

So, this iguana is yours?

Of course it is! How many people do you know would drive around town looking for an escaped lizard!



Your tall, handsome friend is right! Jiggles has been with me for years. Now come over here, so that I can give you each a reward.



Wait! I don't like the way she's staring at me!

Stop being silly. I'm about to get MY reward.

That's right! Come a bit closer!

AS THEY GET CLOSER TO THE CAR, THEY SOON FIND OUT THAT THEY SHOULD HAVE LISTENED TO LUCINDA. IT TURNS OUT THAT THE WOMAN IS NOT A PET LOVER...



...SHE'S MISS ALIGNMENT!



A FEW HOURS LATER, THE KIDNAPPED KIDS WAKE UP INSIDE MISS A'S LAB.



Are you alright?

What happened! Kas, how did you get here?

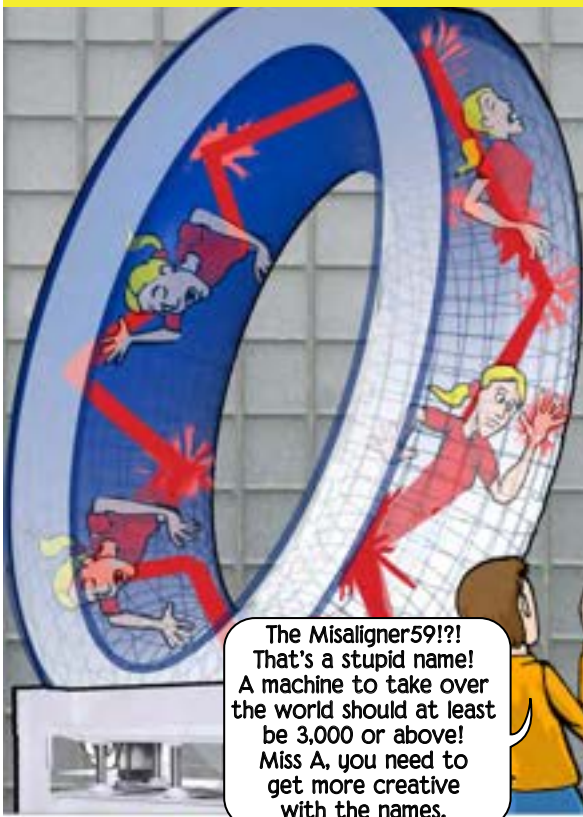
I've been here all day. One minute I was at the mall buying some new guitar pickups; next thing I remember I woke up here.

Hey, how did I get into my Spectra outfit?



Don't worry about how we got here, let's figure a way to get you out of there!

Spectra has been trapped inside a gigantic torus made of thick plastic. Because of total internal reflection, she just bounces around out-of-control.



Spectra, there's only one way out of my cage, and it will trigger my ingenious plan!

To escape, you must increase your energy! Change from your low-energy red to high-energy blue!

And do you know what will happen then?

I need you in blue form to power my machine! The only way out for you is to give me what I want!

To overcome total internal reflection in that plastic prison, you're going to have to increase your energy! You are the last piece that I need to power my "Misaligner59"!

Oh and BTW, I changed your clothes into Spectra. I prefer Spectra, over that weakling, Lucinda.

The Misaligner59?! That's a stupid name! A machine to take over the world should at least be 3,000 or above! Miss A, you need to get more creative with the names.



You're nuts! I AM SPECTRA!

I will not do it! I'm not going to help you shut down every laser in the world! I know what that would mean!

You have no choice! If you don't do it, your friends will die and you will never leave your prison!



Spectra, don't do it. Save the world, not us!



Lucy, I don't want anything to happen to you! Save yourself, then the world.



Uhh.... can't you save us, then the world?

Guys hold on, I can figure this out!





To get out of here, I need to increase my energy; so I will have to become blue, or perhaps ultraviolet...

... and that will make the machine work, turning off every laser in the world.



If I don't do something quickly, the world will be under Miss Alignment's control and I can't let that happen!



But what if I overpower her machine?

But to do that I will need to energize at a level I have never gone before.

I don't know if I can do it, I'm already pretty weak!

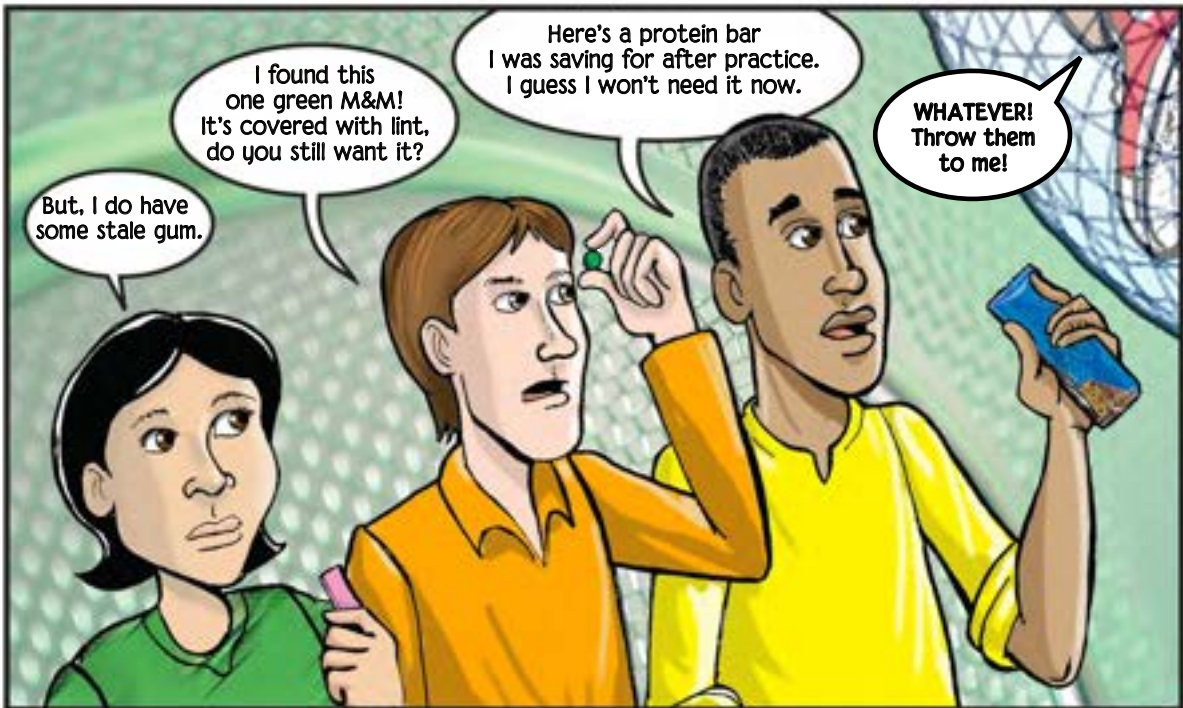


Do you guys have any food in your pockets?

I need to eat something to give me some energy to stop Miss Alignment!

Anything, high in calories would be great.

Is this really the best time to be hungry?



I found this one green M&M! It's covered with lint, do you still want it?

But, I do have some stale gum.

Here's a protein bar I was saving for after practice. I guess I won't need it now.

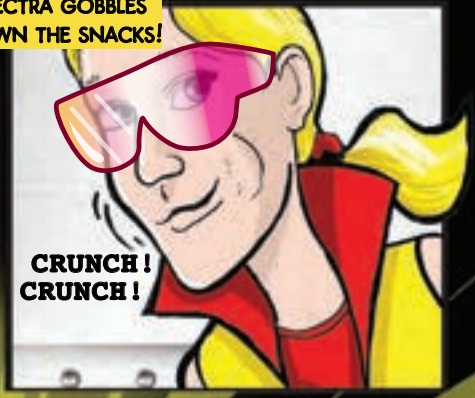
WHATEVER! Throw them to me!

LIKE A FINE-TUNED MACHINE, RUBY AND KAS HAND THE FOOD TO GORDY. WITH CAREFULLY CALCULATED AIM, HE THROWS THE FOOD TO SPECTRA!



I got them all! Great toss QB!

SPECTRA GOBBLES DOWN THE SNACKS!



CRUNCH!
CRUNCH!

Guys!
STAND BACK!

AFTER FEELING STRONGER, SPECTRA NOW HAS ENOUGH POWER TO CRASH THROUGH THE CAGE! SHE SLAMS INTO THE MISALIGNER59!



Yeah, you're a human laser, We know you can do it!

Don't give up!

And you're our BFF! Make us proud!

SKRAK!!

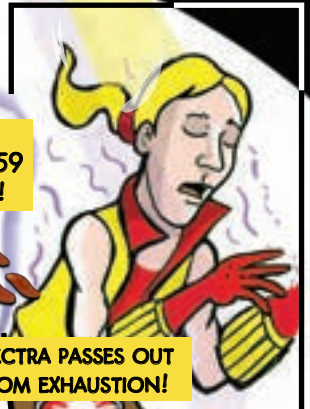
Oh no! I'm powering up, but don't have enough energy to turn it!

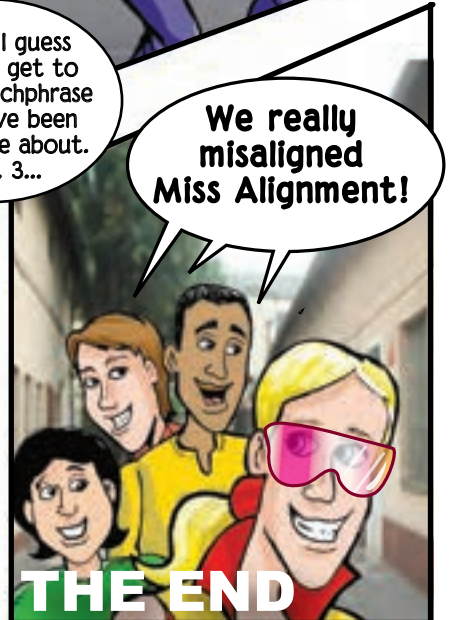
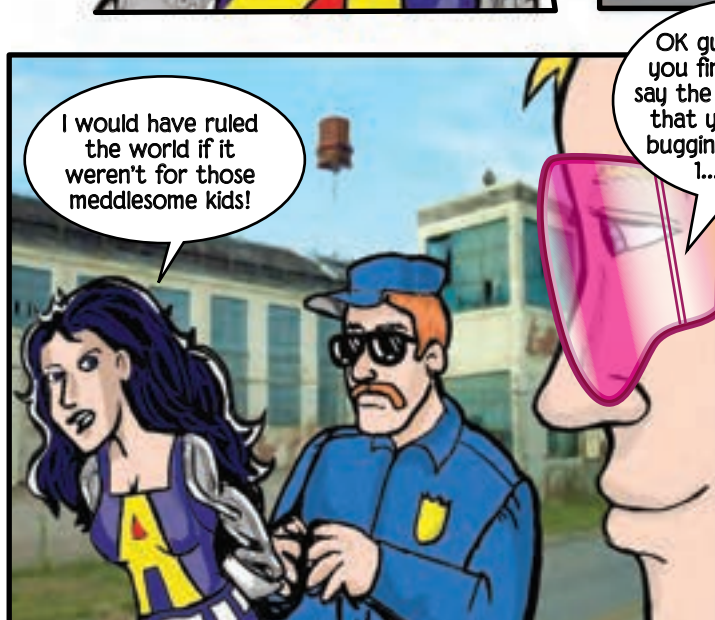
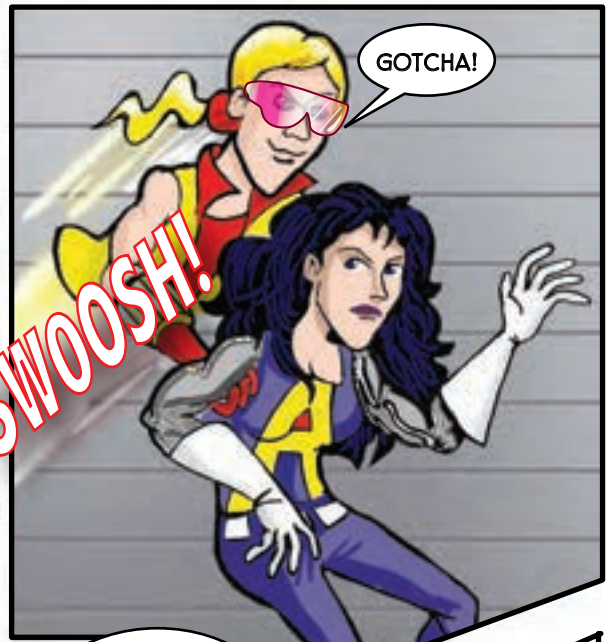
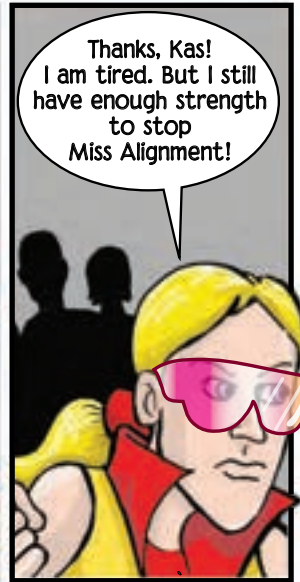
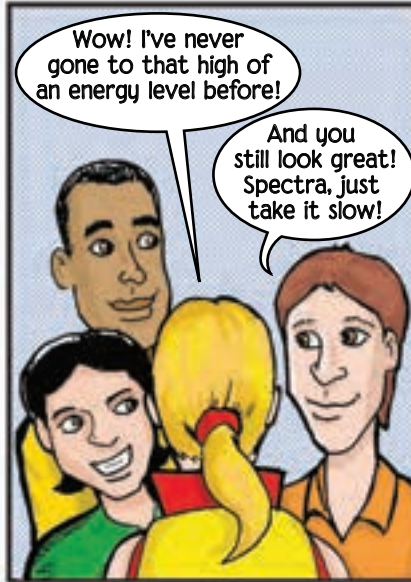
WITH THE ENCOURAGEMENT FROM HER FRIENDS, SPECTRA INCREASES HER ENERGY FROM BLUE TO THE POWERFUL ULTRAVIOLET!

THE MISALIGNER59 EXPLODES!

FAHBOOMM!

SPECTRA PASSES OUT FROM EXHAUSTION!





If you enjoyed reading about the adventures of Lucinda and her friends, make certain you get the first issue of **SPECTRA!**

(Now in its 4th printing)



And go online to keep up with the Spectra characters!

twitter



SpectraStar



RockerKas



Red Rothko



Gordy18



MsAlignment

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Characters created by Rebecca Thompson-Flagg and Kerry G. Johnson

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SPECTRA™

ABOUT THIS COMIC

The purpose of this comic is to teach both about the properties and history of one of the 20th century's most important inventions, the laser.

We have tried hard to make this comic fun and engaging while still being a great educational tool.

We would like to highlight the fact that the main character's names have been chosen with great care. For example, Lucinda's last name, Hene, is a reference to one of the most used types of lasers, a Helium Neon, or HeNe, laser.

Ruby was so named because the first laser was made with a synthetic ruby.

Gordy was named after Gordon Gould, one of the most controversial figures in laser history.

Kas was named after Alfred Kastler, physicist and Nobel prize winner, who developed the technique of "optical pumping" which is key to lasers. As for our villain, as any laser scientist knows, the death of any laser is misalignment.

To learn about Spectra and her friends, visit www.laserfest.org or www.physicscentral.com to download our first comic, *Spectra: The Original Laser Superhero!*



Characters Created by Rebecca Thompson-Flagg and Kerry G. Johnson

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