

THE  
CENTER  
OF THE  
UNIVERSE

What if your  
mother just...  
vanished?

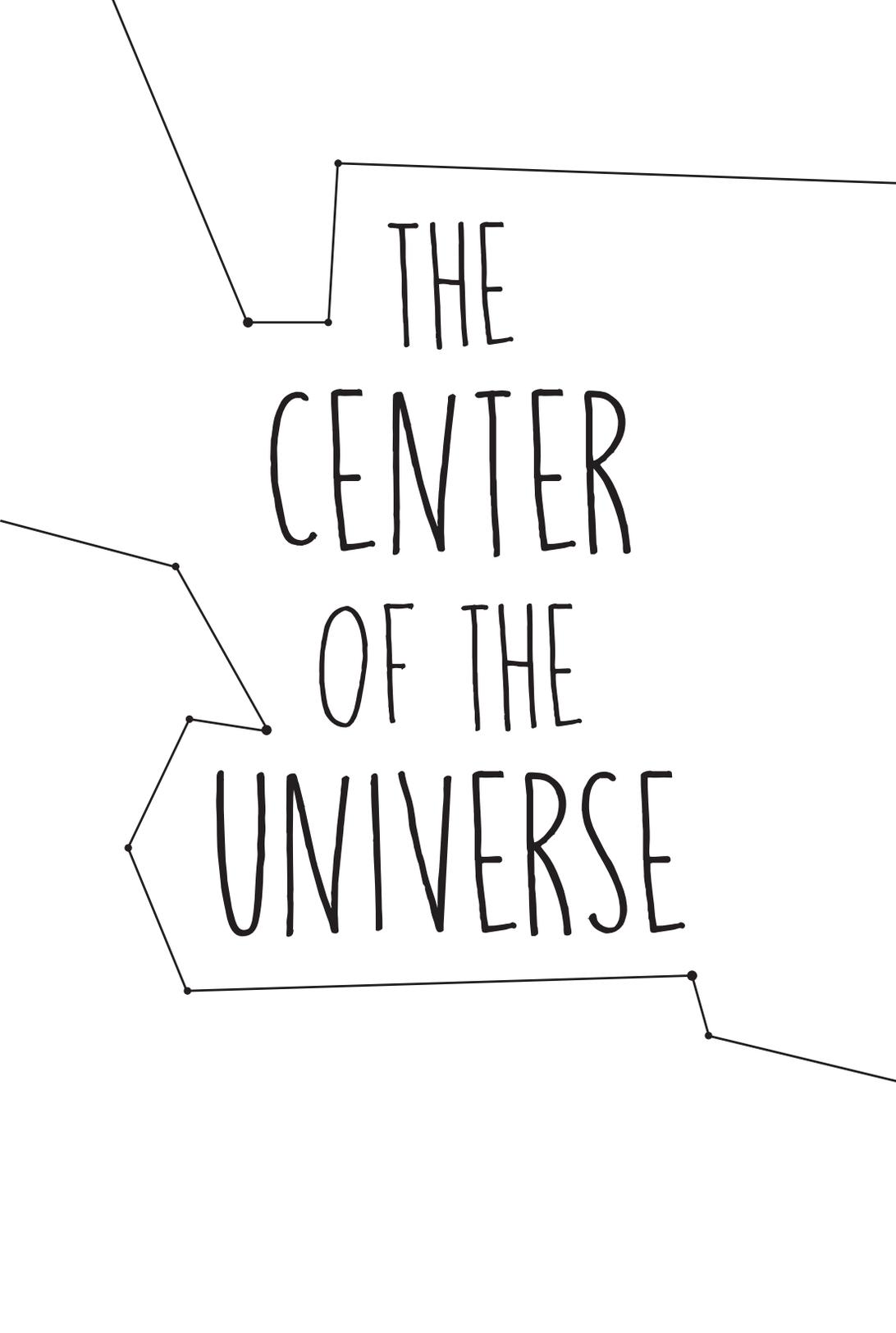
RIA VOROS

**GRACE CARTER'S MOTHER**, celebrity news anchor GG Carter, is everything Grace is not. GG is a star with thousands of followers, while Grace (who dreams of becoming an astrophysicist) is into stars of another kind. She and her mother have always been in different orbits.

Then one day GG just vanishes. Grace and her family — along with the police — are left to unravel the mystery behind her disappearance.

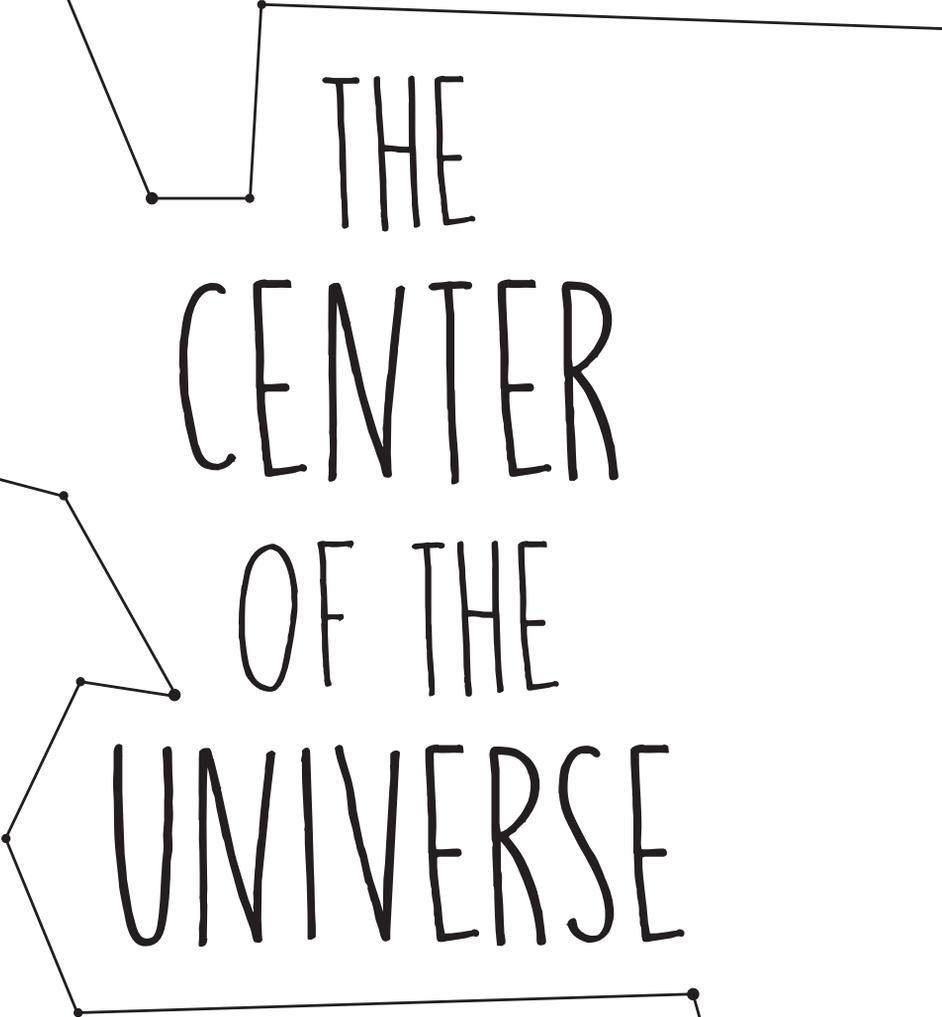
The search brings Grace closer to her high school's golden boy, Mylo, who's faced a black hole of his own. It also uncovers some secrets from GG's long-lost past, leaving Grace to wonder: Did she ever really know her mother? Was GG abducted ... or did she leave?

Author Ria Voros deftly combines mystery with a passion for science in this indelible story of first love, friendship and the gravitational pull between mothers and daughters.



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BY RIA VOROS



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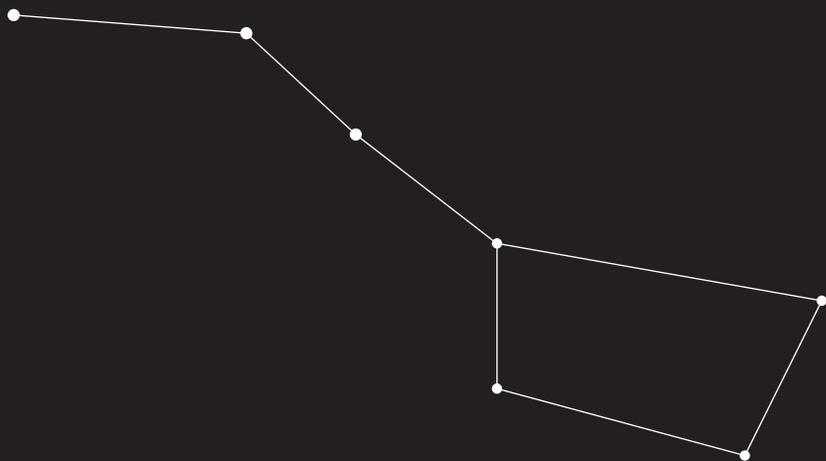
*For my parents*



*All truths are easy to understand once they  
are discovered; the point is to discover them.*

— Galileo Galilei

# BIG DIPPER



# PART ONE



The day my mother went missing turned out to be the hottest May tenth on record. Sidewalks could have fried eggs and kids were getting second-degree burns on playground equipment.

Something woke me up at 7:30 a.m. and I was already sweating. I lay there and tried to drag back the fading memory of the sound I'd heard. A dull noise, muffled.

There it was again — a thud against the wall.

Charlie. My little brother was kicking his soccer ball around the house.

I was about to get up and yell at him when my phone buzzed. I wondered why Iris would text me at this ungodly weekend hour. She slept in late any day she could, which was every day.

But it wasn't her.

*Hey, it's Mylo. Do you think your mom would let me interview her for an English assignment? See you at the game? My cousin's playing.*

Mylo McLean.

Until recently, just one of the good-looking guys at my school, one of those high-mass stars that so many people want to orbit like tidally locked planets. Mylo McLean, whom Iris had met at HackAttack, this coding class she'd started, and texted me to

say she'd become friends with this guy who was into butterflies and wasn't that the best kind of awesome? Turns out he was more into the photography of butterflies, but the details ceased to matter after I realized this was the Mylo from my school, he of the perfect dark eyebrows, and Iris thought the three of us should hang out because she always wanted her people to meet. She's a connector.

She dragged us to her favorite ice cream parlor, and I sat across from him as he ate a banana split and talked about how photography made him whole and stuff, and his eyes softened when he talked about it. I got the feeling he was actually relaxed with us, which was unexpectedly flattering. And that's when he went full neutron star on me — or rather, I became aware of his neutron starriness. It was like I was looking at him through an intensely focused lens and found an undiscovered complexity. There was Iris beside me, chatting like we could all be BFFs because she fervently believed males and females could be just friends, and there I was, staring into my chocolate sundae, asking it to save me from his eyebrows.

Now I stared at his question on my phone. He wanted to interview my mother. Of course he did.

My thumbs became useless on the keypad and autocorrect had to save me. *Sure. She'd probably say yes.* Send. I stared out the window at the clear morning sky and considered my next move. Decided to melt a little more in the insistent sunlight. I imagined his family, neutron stars themselves, had a hard time with physical contact. All those magnetic fields.

My phone buzzed again. *Awesome. Could you possibly ask her for me? I can meet you guys at halftime.*

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The thing was he was kind of uncategorizable now. Before the supernova at the ice cream parlor, he'd been a high-mass star I didn't really think about, but now he was someone from my French class + Iris's buddy from HackAttack + an insect photographer + an owner of beguiling facial features + really nice. The last guy I'd gone out with had been cute, too. We'd had way more in common, space- and snack-food-obsessed as we were. It'd been fun while it lasted, but there had been no butterflies, photographed or otherwise. Maybe caterpillars.

I read his text again. *Do you think your mom would let me interview her for an English assignment?*

I was not the girl who used her mother as an excuse to spend time with a neutron star. I tried not to bring my mother into anything at all.

“Grace?”

There she was standing in my doorway, clearing a raspy throat. Blue silk dressing gown, hair frazzled around her face, far smaller off-camera than on. *GG Carter, you look fabulous.* This tagline always played in my head. Months before, another broadcaster had said it to her with such a thick layer of kiss-ass fakery that it blew my mind, and I couldn't stop it from repeating like a bad meme.

There were dark smudges under her eyes. Fabulous.

“Charlie wants you to warm up with him,” she said.

“Seriously?” I yawned. “It's not even eight.”

“I know, honey, but he's excited. It'll be over by this afternoon.”

“Why can't you do it?”

She looked more tired. “I can, but I had a late night, so I was hoping—”

“That you could go back to bed.”

“Never mind. I’ll ask your dad.”

I got up, instantly five degrees cooler once I was out of the sunlight. “No, I got it. Go back to bed.”

Pause. “Are you sure, honey?”

“Oh my God, really? You just asked me to and now you’re asking if I’m sure?”

Now she was deflated. Not a molecule like the news anchor she had been on TV fourteen hours before. Suddenly I wanted to ask her about the stomach butterflies. If she’d ever had them with Dad, if that had been a determining factor. But I didn’t. Couldn’t. “I’m sure I can keep Charlie from exploding with soccer game anticipation,” I said instead.

“Thank you.”

I stretched my arms out in front of me and my shoulders popped. “But since we’re kind of trading favors — a guy from school asked if he could interview you for a project.”

She rubbed her exaggerated collarbones. “Yes, sure. When?”

“He wants to meet you during the game. It won’t take long, I promise.”

“He’s a friend of yours?”

“Yeah.”

Then she did something she hadn’t done in a long time. She looked me in the eye and held me there. I felt both pinned and pulled. Her gravity was stronger than I expected. “That’s fine, then,” she said softly. “Anything else?”

“No,” I said. “That’s it.”

\*

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*She'll do it.* I sent the text from the kitchen, my bare feet cooling on the tile floor. Thought about breakfast to keep my mind occupied.

“There you are!” Charlie bounded in from the backyard. “Took you long enough. I only have two hours to get ready!”

“Two hours,” I repeated. “That’s a lot of warm-up time, Badger.” He had a way of always living up to the nickname I’d given him when he was two, like it was a personal mission.

“But some of that will be taken up by eating and taking a dump. I have to practice my corner shot. *Come on.*”

I reached for a granola bar. “You may feel you’re Messi in the making, but I’m starved. You can wait until I’ve ingested something.”

He rolled his eyes. The same eyes as Mom’s — a color that defied categorization but was best described as gray-green.

“By the way, she was up late last night. It’s not very cool to wake the whole house up with your stupid enthusiasm.”

“I was really quiet.”

I snorted.

“I was. She said she came down for a glass of water and a Tylenol.” His orange shirt was tucked perfectly into his shorts. I wondered if he’d been practicing that, too.

“You still woke her up.”

He scowled and looked away. “Are you done yet?”

I took a big bite of the granola bar to show how committed I was to eating. “Go warm up for your warm-up. I’ll be there in a minute.”

He took off after only a second of pondering. His bright shirt flashed against the greenery of the backyard. He was a comet —

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fast and oblivious, coming into others' orbits and then leaving again. Always pulled back toward the sun.

Almost as soon as I was comfortable in the universe — the actual, measurable, astounding universe — I wanted to know it all. My space obsession had started on a vacation to California when I'd finished reading *A Wrinkle in Time* at the exact moment we pulled into the parking lot of the Lick Observatory and I'd spent an hour interrogating the poor PhD candidate who was our guide. Dad took Charlie back to the car because he was getting bored and making a mess in the gift shop, and Mom walked around the gallery in her hat and flowing linen vacation outfit. She didn't need to be in disguise because we were out of the country and she wasn't recognized yet anyway, just an up-and-coming reporter sharing ad space with other broadcasters. The guide answered my questions about planets and supergiant stars and black holes, and I felt like I was expanding in a way that could only be love. Cosmic butterflies for sure. The universe was around us everywhere — it *was* us. Like some celestial magic trick I'd only now figured out and would never be able to unsee.

All the way home from California, I bombarded my parents with information I'd learned and questions I still had. My dad

humored me. My mother talked on the phone for half the time with her manager, who'd dumped a huge story on her lap. We'd just gone through the border crossing, and I was wondering aloud what matter would look like at the event horizon of a black hole when she squeezed my shoulder and said, "Why don't you google all this? I'm sure there are fantastic websites out there for kids. And ask your science teacher if you can do a project on space."

I knew what she meant. Get it out of my system. I'd had more than enough fleeting fantasies — paleontologist, veterinarian, spelunker — that she probably wouldn't put too much credence in this one.

Not until I asked for my first telescope.

### 3

The house phone rang as I came in from the backyard, where Charlie was laid out from his epic warm-up like an exhausted puppy.

Patricia Forsythe. Grandma. Mom's mom.

I was so not in the mood, but she always seemed to know when we screened her calls.

"Hi, Grandma," I said.

"Grace! How are you, darling?" Grandma was an actress. Her "darlings" were drawn out, even though she was Canadian like the rest of us. One of the first reviews I read of hers, when I was twelve, had said the smaller the town of origin, the more prima the donna.

"Okay," I said. "Did you want to talk to Mom?" Small talk was not something I could muster. "I think she's just upstairs."

"That's fine, honey, but I want to know how you are," she said. "How's school?" If her voice were a physical thing, it would have been a marshmallow.

She never understood why I was bored in half my classes and super excited about things I couldn't explain with an elevator pitch. "But what use is all that science going to be to you?" she'd

said last time we talked, making “science” sound like “second-hand underwear.”

Instead of answering her question, I asked, “Are you still at the same hotel with the infinity pool?”

“No, I’m in Palm Springs,” she said. “Listen, Grace, I’m going to fly you and Charlie down here. You’ll absolutely love it. You’re seventeen now, aren’t you? So it’ll be fine for you to watch out for him.”

“We’re in school, Grandma. Until the end of June, like most kids.” I climbed the stairs to my parents’ bedroom.

“Oh, I know,” she said. “I was thinking just for the long weekend.”

“The one this month?”

“It gets awfully hot here if you wait too long. It won’t interfere with your schedules at all.”

“Yeah, it will. Charlie’s got soccer and karate and there’s a Star Club field trip that weekend —”

“Star Club? Sounds interesting. What stars do you talk about?”

“Not your kind of stars, Grandma.”

“Oh, well, that sounds right up your alley, then. But listen, Grace, this is a special trip, just for you and Charlie. I’ve got a place booked and everything. You can do me this favor, can’t you? The stars aren’t going anywhere.”

The sound of the phone smashing to pieces on the floor would be so satisfying. “I don’t know if Mom would be okay with it,” I said.

“I’ve already talked with your mother.”

“You have? You guys never talk.”

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“Believe it or not, we have conversations outside of your house, Grace.”

“And she wants us to go to *Palm Springs*?”

“She thought it was a fantastic idea.”

The shower was running in the en suite. “Is she stressed about something?” It was a stupid question; Mom was always stressed — work or Charlie’s eating habits or the gray roots she’d just noticed. But something was different here. Grandma and Mom rarely agreed on anything.

“It’s just work stuff. Nothing that can’t be sorted out. The truth is, I’ve booked her and your dad into a spa while you and Charlie are with me. It’ll be a holiday for everyone.”

“Or a holiday *from* everyone.”

“What’s that?”

“And Dad knows?”

“Of course. They both think you’ll have a fantastic time down here. Really, you should see —”

“Just hold on a second.” Hot steam hit my face.

Mom’s still shape was obscured behind the frosted glass. She was probably standing right under the showerhead, the way she often did, her hair pouring down over her face. She said it relaxed her. I didn’t know how she could breathe.

“Grandma’s on the phone,” I said. My voice bounced off the tiles.

Mom jumped, pressing against the tile wall of the shower for a moment. “God, you scared me, Grace.”

“Sorry,” I said. “It’s Grandma.”

“Sure. Just a minute, honey.” She reached for the white towel hanging opposite the shower door and rubbed it over

her wet hair, her face. Her shoulder blades stuck out.

“Bye, Grandma,” I said into the phone. “Here she is.”

“Bye, darling. See you soon!”

I held the phone away from my ear as Mom finished drying off, throwing her dressing gown back on. “Okay,” she said, shoving her feet into flip-flops.

“Tell me you finally got the time off, Grace.” Grandma’s voice was tinny so far from my ear. “With the kids gone, you’ve got to use it. Has Andrew agreed to go?”

The phone was still in my hand, six inches from my face.

My mother was watching me, her eyes bloodshot. Her thin fingers reached out.

Grandma’s voice was a thousand miles away. “Grace? Are you there?”

\*

The first day of preschool I introduced myself at circle time as sharing my name with my mother and grandmother (who uses her middle name) and everyone thought that was so neat. Three Graces in a row, and one of them a semi-famous actress.

Then I went to Mom’s new work when she got the broadcaster job at ITV and saw how people were quizzical when our names matched but we didn’t. She was thin and blond and I was solid and awkward and dark-haired. People always commented, always stared. Like the first day at my new school in Grade 4: kids wide-eyed when they recognized the Grace who picked me up — she of bus stop posters and evening TV — and then looked over at me.

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By the beginning of high school, I was used to it, but I also had a shield: I was never going to be like her anyway. I took on our differences as if I'd chosen them all, and soon enough it felt like I had.



I first met Iris at Star Club, our astronomy group. She showed up the night we were looking at some images that the Hubble Space Telescope had taken. She walked in late, when the room was dark and we were all transfixed on an image of two galaxies colliding in swirls of green-blue gas. I was standing at the back, where the tall people were relegated, and Iris walked right into me.

“Jeez, sorry,” she whispered. “Didn’t know you were there.”

“That’s not what I usually hear,” I whispered back, noticing in the faint light from the screen that her ponytail was almost on the top of her head. She exuded the smell of cinnamon gum.

“Is that Claudia?” she asked, pointing to the front, where Claudia was explaining the image.

“Yeah. She’s a kick-ass astronomer.”

“I know. She’s my mom’s friend. I’m doing a project on hot Jupiters, and she said I should come check this out.”

“What school do you go to?”

“It’s a self-directed project,” she said. “I homeschool. I interviewed Elizabeth Tasker last week.”

That got my attention enough that I forgot to whisper. “You talked to Elizabeth Tasker the astrophysicist? How?”

The guy beside me shushed us.

“I emailed her and then we Skyped,” Iris whispered. “She was really nice, too.”

As Claudia moved on to the next image, I turned back around, astounded that the girl who’d just walked in had interviewed my favorite exoplanet researcher *via Skype*.

“I’m Iris Falino, by the way,” she breathed in my ear. She must have been balancing on tiptoes.

I bent down a little. “I’m Grace Carter. You sound like you have superpowers.”

“Ha, no. Just time to geek out.”

The guy beside me cleared his throat at us.

“Grace Carter,” Iris murmured.

I ground my teeth, waiting for her to make the connection.

“I love the name Grace,” she said. “It’s so classic.”

\*

I texted Iris as we pulled into the parking lot overflowing with soccer parents and players and, inexplicably, a group of kids dressed as *Star Wars* characters.

*Mylo’s going to meet us.*

In front of me, Mom murmured something to Dad. He shrugged without looking at her.

*Didn’t know he was into soccer?* Iris replied.

My stomach did the flutter thing again. It was intensely annoying. *He wants to interview THE Grace Carter. School assignment.*

*Ah, right. Come save me from being buried alive in packaged bread products.*

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Iris's wavy hair was up on top of her head, and she wore a short flowered sundress with hightops. She had the usual silver bangles on her left arm, and since her happiness could be gauged on what I thought of as the Bangle Scale (from 0 to 6), and there were currently five hanging from her wrist, it had obviously been a decent morning. She chewed her lip at her phone screen. "Hey," she said without looking up. "Just a sec." She clicked on a few things and then pocketed her phone. "Aasiya's family just found a new apartment, and she asked us if we'd help them move in." Iris and her parents were part of a network that sponsored refugee families. For the last few months, half her time seemed to be spent doing fundraising things for the next family they wanted to bring over. Another chunk of her time was spent answering texts from Aasiya, who came from Somalia last year and was only a few years older than us and had two kids. Iris's parents had helped her husband learn to read English.

"So is the Uppercase in disguise today?" Iris asked.

"Film star camo and her signature give-me-some-privacy force field." I moved to let a stroller past.

"Are you guys still fighting?"

"No."

Someone set off an air gun and everyone looked around. The game wasn't starting for another twenty minutes.

"That thing that happened at Star Club," Iris said. "You know what I mean."

"It's fine. I just don't need to be around her that much. We do our own thing. It's actually pretty healthy." I couldn't meet her eye. Iris had a close relationship with her parents, so by comparison mine was a chronic illness that responded well to

treatment. I considered telling her about Palm Springs. If there was one person who shared my dislike of Patricia Forsythe, it was Iris. But suddenly I didn't feel like bashing a family member with someone who would never bash any of hers with me.

# 5

Before the space obsession, before spelunking and fossils, I'd been a weird little kid with a thing for patterns. Math was just fun little puzzles and a Rubik's Cube was a delightful game of algorithms. I saw repeating patterns in fabrics and sidewalks the way some people see bright colors — they jumped out and announced themselves. I didn't understand how other people missed them.

In Grade 5 I got in trouble for pointing out the way the principal chewed her pinkie finger when she thought no one was watching. It — and she — had been getting more and more ragged for weeks, and this coincided with studying the brain and habits in our class. "You're just like the example in our unit," I told her. It turned out she was getting divorced. My mother was mortified when she got the call from the school.

But I kept observing people, their stuff, their words like they were puzzles. Some people bit their lips, some blinked fast while they were thinking. Charlie pulled on his ears when he was sad. My Grade 7 teacher said "basically" in every third sentence. The old guy across the street did a reconnaissance mission around his perfect front yard at exactly seven every night. People were

weird and let more of themselves be seen than they realized. If you knew what to look for.

Mom had two calming habits. She clicked her tongue quietly to herself when she was nervous, and when things got really bad she pulled on her fingers. Slowly and methodically pulling on them one by one, then switching hands.

Once when I was twelve I found her in the kitchen reading something from work and clicking to herself, and I startled her when I said, "What's wrong?"

She leaned on the counter, trying to seem relaxed. "Nothing's wrong, honey. Why would you ask that?"

"You're clicking," I said.

"I'm what?"

I demonstrated.

Her eyes got bigger. People did that when I pointed out their habits.

"It's okay, you don't have to tell me," I said, because I suddenly felt bad. Back then we were still friends, still stepping comfortably into each other's space instead of around it. I didn't want her to think I was studying her.

"I've just got this huge story to prep for." Her lean on the counter turned into more of a sag. "I'll be up all night with it and then tomorrow's the taping ..."

"Can I help?" I asked. I imagined it was something like helping with homework.

She reached over and squeezed my arm. "You're sweet, but no. It'll be okay." She started pulling the fingers on her right hand. "Don't you have a sleepover to go to?" It had been canceled because Leanne had come down with the flu. Mom got to the

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last finger and clued in. “Oh, right. I’m sorry, Grace. How about you pick a movie tonight? I’ll make you popcorn.” She hugged me against her, and I could smell her skin. She’d been softer then — less bony. More sweet, with some fragrance — a soap or lotion she used. Thinking about it years later, I figured the scent had disappeared so slowly that I didn’t notice it until it was gone, but now the gone-ness of it was stronger than the smell ever was.

\*

There she was pulling her fingers again in her nineties-era folding chair, her ball cap low over her face, Jackie O shades on. Watching eight- and nine-year-olds career down the field as if their lives depended on killing the ball.

Iris settled down between me and Mom, tucking her legs under her. In between plays, she chatted about how well Aasiya and her family were managing.

“No, you’re right,” Mom said to her as I zoned back in. “It’s a real challenge to get the community on board sometimes.”

“My mom says there was some resistance at the town hall meeting last month. I don’t understand how people can be like that. These people have *no home*.”

Mom nodded. “But it’s hard to change people’s views. We see it all the time with comments on stories.” A wood-beaded bracelet slipped down her arm as she tugged her cap lower. I’d never noticed that piece of jewelry before. It looked like something Iris would wear. Maybe Mom was trying to recapture her youth.

On my other side, Dad stared out at the field as if trying to figure out all the players’ shoe sizes.

“What are you talking about?” I asked Iris.

“Refugee resettlement,” Mom said. “ITV has donated a lot to an organization in Kenya. I set up the connection myself.”

Iris’s eyes widened. “I didn’t know you did that.”

I leaned back on my hands. It was crazy hot. There was no good reason to be sitting in direct sunlight, even for Charlie’s game.

“Did you see that play?” Dad asked, nudging my arm.

“I think I missed it.”

“Charlie’s on form.” He looked over at Mom. “Did you see it, GG?”

The people beside us spilled a bag of chips all over the grass and laughed.

“Darn,” Mom said. “I missed it, too.”

\*

“I need to pee.” Iris nudged me as the ref blew the whistle for halftime.

The women’s restroom had a huge line and the men’s smelled disgusting, so we walked to the corner of the park with the playground and scouted out the best shrub.

I turned and stood guard as she squatted.

“So, hey,” she said from inside the leaves. “I was thinking we could leverage Mylo’s connection for a good cause.”

I picked a crumb of granola bar off my T-shirt. “I don’t follow.”

She got up and rustled out of the shrubbery. “I mean, his mother is Sun Ah Kim.”

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I stared at her. “Yeah, I know she’s Korean.”

Iris rolled her eyes. “Sun Ah Kim is the director of the Milliner Foundation. Started by that superrich family in Vancouver? And she used to be a politician — my parents hated her party, but whatever.” She blinked at me expectantly.

“Okay ...?”

She gave up hiding her contempt. “Seriously, Carter. Your mother was just talking about the Milliners a minute ago. She said Sun Ah Kim’s name — they, like, know each other. You were *there*.”

“Apparently I wasn’t.”

“I don’t get you sometimes. Your families basically run in the same circles and you didn’t make the link? Ugh, come on.” She started walking, her canvas bag bouncing on her hip.

I’d spent the past five years putting distance between my mother’s life and mine. What did I care about people she knew?

“What I’m saying is, what if we could get Mylo’s mom to come to our big refugee fundraiser in the summer and bring all her rich friends?”

“We?”

“Well, since we’re all hanging out now, it’d be easier to convince him. Two against one.”

“That seems kind of icky. Is that how fundraisers are supposed to work?”

She shook her head. “It won’t be icky.”

My phone buzzed and we both looked at it.

“Is it him?” she asked.

*Running late, his text said. I’ll be there in five. Where are you?*



# 6

When we got back to my parents' spot to meet Mylo, my mother's chair was empty.

"Dad? Where's Mom?"

He put his hands up, then deflated with a groan, along with half the crowd. "So close *again*."

"Hello? Mom?"

He glanced at me, confused. "Oh, she went to take a call. Someone at work."

"Great. I hope she's not going to spend the rest of the game on the phone."

"It's happened before," he said, turning back to the action.

"Let's go," I said to Iris.

"But Mylo —"

"Can't talk to her if she's not here."

"Are we looking for her or him?"

"I don't know. Maybe we should just go for ice cream and forget everything."

She came around to peer into my face. "Hey, you. What's up?"

I was pissed that Mom had just walked away, I was pissed that now Mylo would show up and we'd have to explain her

absence, but it wasn't just that. I was pissed at Dad for being so nonchalant about it, and maybe pissed that Iris could just inveigle her way into Mylo's family so quickly. I was pissed at Grandma for being Grandma. Probably I was pissed at Charlie for making me come to this stupid, sweltering game.

"Hey, I found you," said a voice behind me.

Of course he'd found us. The magnetism was undeniable. My heart rate began to climb.

Iris jumped in before I could fully turn around. "So, Mylo, what are your family's thoughts on refugee resettlement?"

I got to see his puzzled expression, complete with one very attractive raised eyebrow. Something shout-worthy happened on the field, and I managed to turn my face away from his powerful gravity.

"Uh, I think it's a good idea?" he said. "Why?"

"Funny you should ask —"

"My mother's gone to take a call," I said, "so you might have to wait for the interview." His forehead was now lined with confusion and I wanted to touch it.

"That's okay," he said. "There's still a lot of game left."

I shrugged. "She could have a lot of call left. I'm just saying this is how it goes sometimes with her."

"Hey, I saw a good vantage point over there" — Iris pointed through the sea of spectators — "so we can see the game *and* talk business."

"Business?" Mylo asked.

She was already on her way there, so Mylo turned and I followed like one of the orbit-trapped planets at school I'd always made fun of.

## THE CENTER OF THE UNIVERSE

She'd climbed up on the wooden box that held equipment for the field and grinned down at us like a kid. "See? Prime viewing."

Mylo climbed up and held out a hand to me, which I thought about not taking but then was claspng, and he pulled me up. Even after he let go I could still feel his warm hand around mine.

"That's my cousin — the kid with the red hair," he was saying to Iris. "He's pathologically obsessed with soccer."

"Are your parents here, too?" Iris asked. I glared at her, but she was looking at the field.

He squinted into the sun. "No. My mom's got this big charity thing."

Iris gave me the side-eye and I glared back. We'd perfected the art of eye-only communication through our nights at Star Club.

"What does your dad do?" I asked, to stop Iris from jumping in.

Mylo stared at the box under our feet. "Literature instructor."

"At the university?" Iris asked.

"The college. He's worked there for, like, ten years." He frowned.

I could see Iris formulating a question. She was good at friendly interrogation but not always tact.

"Maybe my mom could call you tonight?" I said, taking the risk of touching his arm. "If she doesn't come back before the game ends?" We were basically the same height, which was pretty normal for me, being taller than most girls at school. I liked being able to look straight into his face. He was six inches away. There was a faint scar under his lower lip.

“Yeah, sure,” he said. “Whatever works.”

Iris’s phone rang and she groaned when she saw the screen. “My dad’s rebuilding my computer and he keeps asking me a million questions.” She put the phone to her ear. “Yeah, Dad. Yes ... but I don’t need that much storage ... Well, then just use it ... I don’t know!”

Everyone around us roared suddenly, and we all looked up to see that Charlie’s team had scored.

Mylo grinned at the jubilant parents below us. “This is all Spencer’s going to be talking about for days.”

“My brother, too,” I said.

“Just hang on, Dad, I can’t hear you.” Iris jumped down from the box and called back, “Don’t take off, okay? I’ll be two seconds.”

“We should take off,” I said, and Mylo laughed.

The celebrations stopped and the game started up again.

“Can I ask you something?” he asked.

It was like the volume button got turned down on everything around us. I thought of calming things. The surface of the moon through my telescope, the mountains and canyons of varying gray. “Sure.”

“How come GG Carter’s your mom and you don’t ...” He seemed to be considering the unsaid words.

“Hang out with Sasha Rosenberg and her people? Your people.”

His eyebrows knitted together so perfectly. “Not exactly, but ... yeah. I just mean you seem pretty different from your mom. From what I expected.”

“But you haven’t actually met my mother yet. People think

## THE CENTER OF THE UNIVERSE

they know her because she's everywhere, but that's TV. That's makeup."

"So she's not like she seems?"

"Is your mother what she seems?" I didn't know why I asked that. Why I felt suddenly annoyed.

"Uh, actually no." He glanced away. "But maybe no one is."

Even though there was the game for us to be interested in, it started to feel awkward, and I hated that. I'd made it that way and I didn't know why. I really didn't want him to hate me. "I don't mean my mom's some ogre in real life or anything," I said. "It's just a false familiarity, you know?"

He blinked at me. "Yeah."

"I have my own interests. My own life," I said. "I don't care about being seen." I emphasized "seen" with my hands.

"So what *are* your interests?" he asked.

I knew I'd see his right eyebrow raised in question. There it was.

"Astrophysics. Planetary science. Cosmology. Also, crunchy food and jellybeans."

He studied me and I swore my core temperature was rising. "Awesome," he said.

"You?" I asked.

He pulled out his phone. "I posted a few new shots last night." He opened his photos and showed me one of an iridescent green butterfly.

"That's amazing," I said, taking his phone and pretending to be cool that our fingers touched.

"Thanks. But I don't have three hundred butterflies trapped in my room or anything. I'm not a closet lepidopterist."

“A closet what?”

“A butterfly scientist. I love photography and I also have this wicked collection of butterflies from my grandfather.”

“Okay, the fact that you know the scientific name is telling me otherwise.”

He laughed and I couldn’t stop grinning. “My grandfather was one,” he said.

“Of course he was,” I said.

We looked at each other and the back of my neck started to heat up.

“Hey, kids.” Iris scrambled back onto the box. “That was painful but I’m back. What did I miss?”

# AN INTERVIEW WITH DR. ELIZABETH TASKER

One day when I was working on a later draft of this book, I walked into my local bookstore and saw *The Planet Factory*, Dr. Elizabeth Tasker's book about exoplanets, on the Read This! table. I knew I had found the astrophysicist for *The Center of the Universe*. Luckily for me, Elizabeth was happy not only to be turned into a fictional version of herself, but also to be interviewed about her career and thoughts on space science. I'm thrilled to share her responses here.

## **1. How did you come to pursue a career in astrophysics? Did you always want to be a space scientist?**

*When I was a kid, I was absolutely certain I wanted to be a country veterinarian, but in truth, there was little about a rural vet's life that actually matched my skill set or temperament. I enjoyed the theoretical models and ideas of all the sciences, but I was a hazard in the lab (which would likely have extended to the stall where a poor cow was trying to give birth).*

*But since the age of nine, I'd also been captivated by space. My dad had taken me to the London Planetarium as a birthday*

*treat and bought the picture of Saturn that is mentioned in The Center of the Universe (it's all true!). I'd done school projects on the solar system and bored everyone to death with strange facts about black holes.*

*When I was thirteen, my school gave everyone a careers assessment test where this stood out clearly in both my aptitudes (physics all the way) and interests (astronomy and writing). After that, I started to re-think the cow idea.*

## **2. What is your favorite piece of space trivia?**

*That the surface of Venus can melt lead and the longest a spacecraft has survived on the Venusian surface (to date) is about two hours. I like this one because Venus is a planet almost exactly the same size as the Earth. If we were to see Venus as an exoplanet and make an estimate of its surface temperature based on its distance from the sun, we might guess about 27°C (80°F) — a nice temperature for a beach trip! The fact that Venus is so much hotter shows how much there is to learn about Earth-sized planets in our galaxy. Why do we have two planets, nearly the same size, around the same star (our sun) that are so completely different? What does this tell us about the chances of finding another habitable planet? I find this all very exciting.*

*I also like the trivia that there are more stars in the universe than grains of sand on the beach. I was once asked how many stars there were when I told a border control guard for the United States that I was an astrophysicist. I replied with this trivia and he asked me which beach I meant. I said, "All the beaches! There*

*are more stars than the sand on all the beaches in the world.” He refused to believe me and I worried for one nasty moment that he wouldn’t let me into the country! (He did.)*

### **3. What excites you about your field right now?**

*In the last twenty-five years, we have gone from knowing just the planets in our solar system to thousands around neighboring stars. This told us our little system of planets is not alone, but what we don’t know yet is what these new worlds are really like. I think the next twenty-five years will change this, as new telescopes will be built that can detect the atmosphere around exoplanets. The gases in the atmosphere are a real indication of how a planet forms and what might be going on at the surface. We’ve found many Earth-sized worlds, but will any of them really be like our Earth, or did they form in wildly different ways?*

### **4. What is the coolest thing about your research?**

*I really like computer programming. When I began my PhD in the early 2000s, I was captivated by the idea that you could build whole sections of a universe in a computer. It is like making physics your giant toy box: you can turn on and off effects such as magnetic fields, star formation — even gravity — and watch what happens. Using powerful telescopes is of course amazing, but you don’t get to play around with the universe. Learning how to code models for supercomputers (room-sized computers*

*that have thousands of processors) was a huge draw to the field for me.*

## **5. What has been your most surprising finding?**

*In truth, science research is rather sparse on the “Eureka!” moments, but the reality is actually even more satisfying. In research, you explore one aspect of a problem that might not tell you much on its own, but when combined with the work of other researchers can reveal something amazing. One of my favorite debates is from my studies in star formation, where I ran computer simulations showing that cold star-forming clouds of gas in our galaxy may frequently collide. Another research team had previously suggested that such collisions could be responsible for creating massive stars, much bigger than our own sun. A different group were observing evidence that this might actually occur. All together, our work suggested that these so-called cloud collisions might really be responsible for quite a bit of star formation. It was not a single person, but the results from researchers all around the globe.*

## **6. What advice do you have for young adults interested in studying space sciences?**

*I actually love the advice my character gives Grace when she tells her she wants to be an astronomer. In the book I tell her she can still find astronomy fascinating but not pursue it as a*

*career. Astronomy is indeed a wonderfully exciting field and I would encourage anyone with an interest to explore their curiosity to their heart's content. But life is full of opportunities and it's always worth keeping an open mind to what else might be out there. If I had not done this, I would have probably been a very bad and unhappy vet!*

*Even when I went to university, I intentionally studied physics for my undergraduate degree, rather than looking to specialize in astronomy or astrophysics early. This was because I knew there were many areas of physics we don't hear much about at school and these would be fascinating.*

*So I would say if you want to do space science — go for it. I have complete faith you'd make an amazing scientist. But don't hold yourself back by not exploring other areas that also catch your interest. As my character tells Grace, you can still love astronomy but not be an astronomer. I would add that it is also possible not to be a research astronomer, but still make a huge impact on the field.*

## **7. Who do you admire in space sciences?**

*When writing my answer here, I kept changing my mind! This isn't because I'm very indecisive (okay, it's maybe a little bit because I'm indecisive) or because I've not felt the same thrill as Grace when I've attended a talk by a scientist I'd heard about (I certainly have). It is because it takes the enthusiasm, passion and commitment of so many different people in many different areas to advance science, from research to communication to politics.*

*For example, when I was Grace's age, I loved hearing the story of how Jocelyn Bell Burnell discovered pulsars (a type of dead star) during her PhD. Pulsars emit a flash that is so regular that Bell Burnell and her adviser first thought it was possible this was a signature from an extraterrestrial life form. My love of computers meant I was also in awe of Margaret Hamilton, who developed the software for the Apollo space program and is often pictured with a printout of her code that towers over her head.*

*And then, I keep up with much of my space and astronomy news from great science communicators such as Phil Plait and Emily Lakdawalla. I also avidly read the blog posts by Italian astronaut Samantha Cristoforetti when she described life on the International Space Station.*

**8. If you could give your teenage self a piece of advice about anything, what would you say?**

*I would tell her not to worry that she might not be good enough. In science we often talk about something called "imposter syndrome." It means that you think everyone around you is better than you. Of course, it's absolutely not true, but almost everyone tends to suspect this is the case and that sooner or later, they'll be "found out" to be not worthy of their position or degree or people's respect.*

*I definitely felt this way: I didn't find school easy and I wasn't top of my class; in fact, I was bottom at math when I was eleven years old (and let's never talk about French tests). I really wanted to study science but even as I became a stronger student, I*

*suspected my good grades were just due to luck that would one day run out. I am really glad that this common insecurity is now something that is being talked about a lot more in the field. Success depends on many things and it's very rarely about raw, born-with-it ability. It's passion and hard work all the way.*

You can learn more about Dr. Elizabeth Tasker's work at [www.elizabethtasker.com](http://www.elizabethtasker.com).



# ACKNOWLEDGMENTS

This book started out as a what-if. A what-if about a mother and daughter, about a relationship and a family and a future changed by abduction. It's been five years since I started playing with those what-ifs and almost nothing is the same as when I began the story. I love that magic.

My stellar agent, Louise Lamont, read this story when it was only the first forty pages, then cheered and guided it into what it has become. Agents Allison Hellegers and Alexandra Devlin also steered it toward its home. My amazing first readers have all given me their sage advice and support: Claire Tacon, Kellee Ngan, Rachele Delaney and Hannah Tunncliffe. My teen readers, Hailey Johnson and Emma Mackay, gave valuable, detailed feedback.

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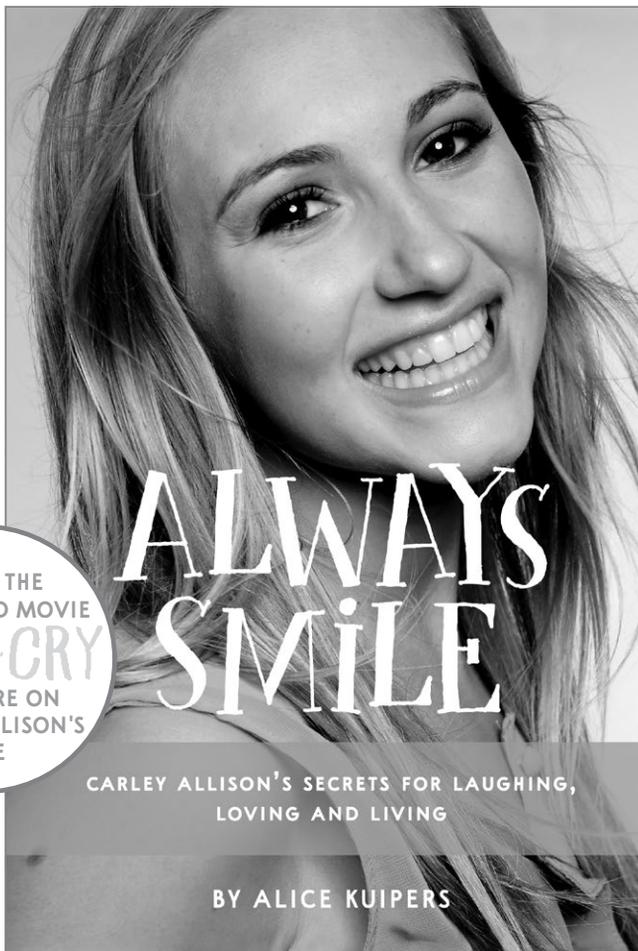
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When she's not writing, teaching or eating sweet things, Ria can be found hiking to the tops of mountains or continuously getting the sand out of her children's shoes at the beach. She lives in Victoria, British Columbia, Canada, with her husband, daughter and son.

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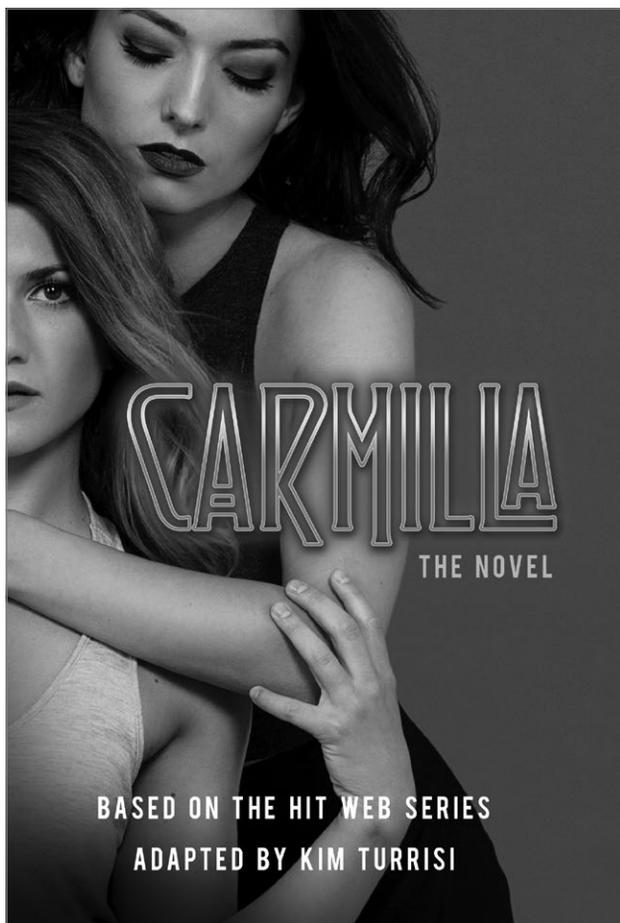
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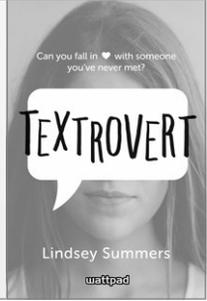
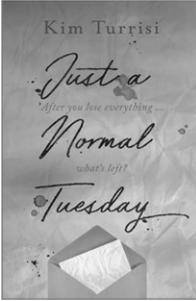
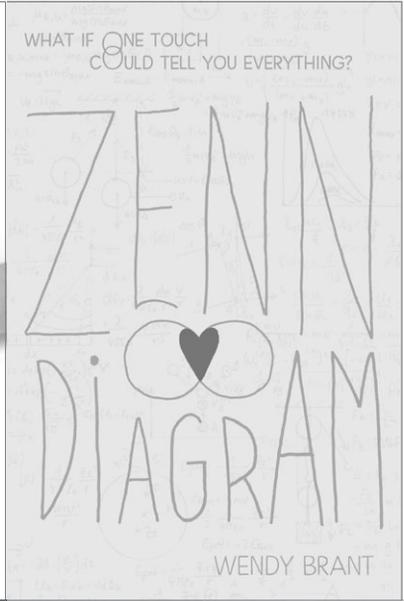
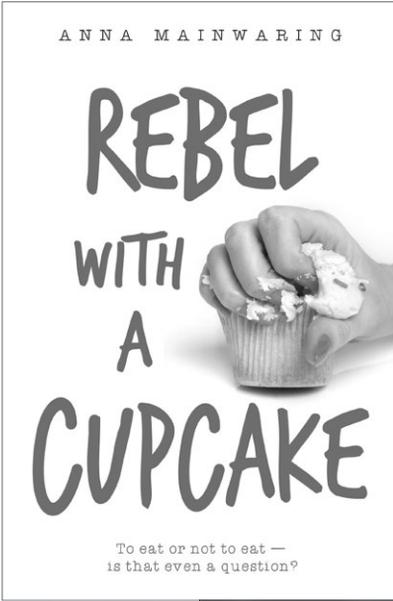


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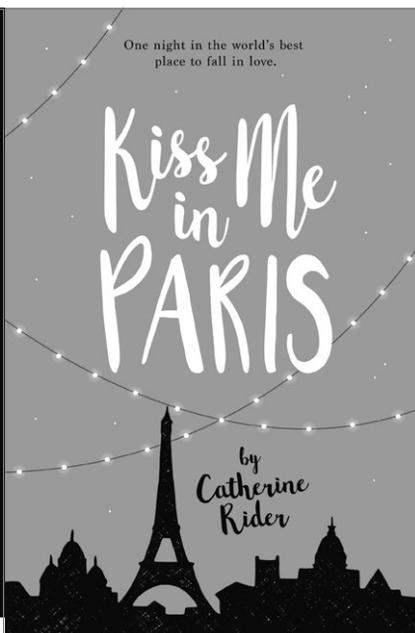
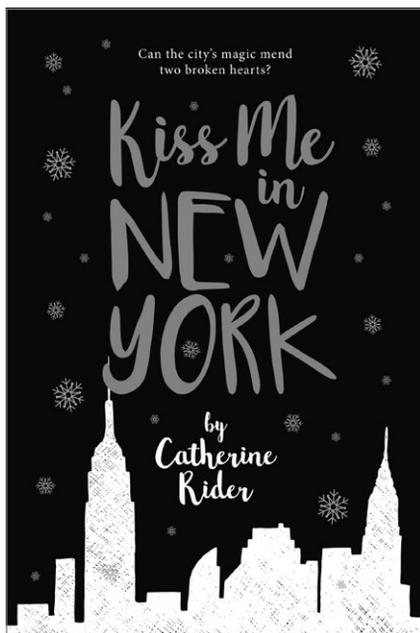


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