

## THE DISTANCE BETWEEN TWO HOMES

# The Distance Between Two Homes

*A PhD, Two Homes,  
and Too Many Questions*

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Mumbai  $\longleftrightarrow$  West Lafayette  $\longleftrightarrow$  Boston

Shaped from personal essays written between 2021 and 2025. The events are true to the author's memory; the chronology has been tightened, and some scenes have been joined for the sake of one continuous story.

Based on the *Curious Writings* series.  
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*For Aai and Baba —  
who always knew I would come home,  
whose hand stayed on my head  
however far the ground beneath my feet moved.  
And for everyone who stayed.*

*Change is the only constant.*

— the caption on a photograph, the first week of a PhD,  
somewhere over the Atlantic, 2021

# Author's Note

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I started writing these stories in 2021, mostly because too many things were happening and I needed somewhere to put them. Moving from India to the United States for a PhD sounds like one large event. In reality it is a thousand small events: your first terrible meal on a long flight, a bag left on a shuttle, a photograph from home arriving exactly when you are trying to work, an atom finally appearing on a camera, your parents looking out at American highways for the first time.

I wrote about these moments separately. Some essays were travel updates, some were rants, and some were basically me asking questions that I had no ability to answer. A few were written when the event was still fresh enough to hurt. Others came later, when nostalgia had already started editing things in my favour. That is memory for you. It keeps a few photographs, loses the video, and then confidently tells you what happened.

This book clubs those writings into one story. I have cleaned the chronology, joined a few related moments, and added what I understand now. But I have tried not to make the twenty-five-year-old version of me sound as if he knew the ending. He did not. Most of the time he was just trying to pass a course, fix an experiment, cook dinner, call home, and look confident while doing all four.

The science in these pages is real, but this is not a technical book. It is about everything that happens around the science: the confidence you lose, the people who return it, the family that stays involved from eight thousand miles away, and the achievements that are far too small for a CV but somehow large enough to change you.

*Saumitra*

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PART I

# Departure

*A PhD does not begin when you enter a laboratory. It begins when the familiar scenery falls away, and you find out which parts of yourself can travel.*

MUMBAI → CHICAGO, 2021

# Wuhuu, Landed in USA!

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**T**HE FIRST MEMORABLE THING AMERICA GAVE ME was a missing bag. Not some grand view of Chicago, not a life-changing realisation at immigration. One bag, left behind in the airport shuttle.

I had travelled from Mumbai to Delhi, Delhi to Chicago, and then another two and a half hours through highways and cornfields to Purdue University. A senior picked us up and took us to our apartments. I called home and gave everyone the successful-arrival report. The journey was smooth. America had accepted me. I had reached the place for which we had spent months planning. Wuhuu, landed in USA!

Then I counted my luggage. One bag was still on the shuttle.

My Indian mind immediately announced that I would never see it again. I started explaining to myself why the things inside were not that important anyway, which is a very useful argument the brain creates only after losing something. Unfortunately, the things were important. So that philosophy survived for maybe three minutes.

The bag came back two days later, completely fine. I was relieved, obviously, but also slightly embarrassed by how quickly I had declared the situation hopeless. That became my first lesson in America:

*Everything can be fixed, and what cannot be fixed can be lived without.*

At that time I was talking about luggage. Later I used the same line for experiments, apartments, plans, and a few versions of myself. Not bad value from one forgotten bag, no?

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The bag was only the comic ending. The real departure had happened much earlier, and strangely it happened on the short Mumbai-to-Delhi flight, not the international one.

As soon as the plane took off, a massive junk of thoughts came into my mind: *No, I cannot do this. I cannot leave everything I have in India for something I may or may not have in America.* This was after applying, accepting the offer, announcing the decision, packing everything, and reaching the plane. Very efficient timing by the brain!

I was alone, and loneliness plus a lot of free time is not an ideal combination for me. I tried to analyse why I was feeling this way. That did not help. Then I started listening to music, and song by song the low feeling disappeared. Nothing outside had changed. The plane was still taking me away from home. But my mind was no longer concentrating only on that fact.

We always complain that music distracts us while studying. We forget that the same distraction can be used when we are concentrating too well on the wrong things. On that small flight, I realised that our mind focuses on what we let

it focus on. If you look straight ahead, you genuinely do not know what is happening behind your back.

By Delhi, the panic had loosened its grip.

The international flight was sixteen hours and my first one ever. The seat was not as good as I expected and neither was the first meal. So I remembered a rule that had helped me many times: you cannot get disappointed if you set your expectations low. I lowered them immediately, and suddenly the flight felt much better.

Two Indian students were sitting beside me. We began with complaints about United Airlines, because there is no better way to start a friendship than complaining about the same thing. Complaining alone is useless; nobody shares the load or even reacts properly. In a group, it becomes a conversation. Soon we were discussing our hometowns, universities, and completely different views about life. By the end of the flight, after sleeping for only two or three hours, we were actually praising the airline and even the food. Humans are funny that way. We can start rewriting an experience before it has finished.

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I had expected to post the whole journey online. During an earlier Bangalore trip, two or three hundred people practically knew what my taxi driver looked like. Surely going to Chicago deserved more coverage, right? Surprisingly, I did not post a single picture. The people I really wanted to tell already knew, and they were sad that I was going. What would everybody else do with the information? For once, living the journey felt more important than proving that I was living it.

Chicago gave me the compulsory “I have landed in the USA” excitement. It lasted until I noticed that the airport looked like an airport and Americans were also humans. A

few things were different, yes: the toilets, roads, and especially the cars. If you look only at the cars, it feels as if nobody in America has money problems. Look at the people and the balance returns.

After this important international observation, my new friend and I sat in front of a McDonald's and shamelessly ate the plas packed from home while gossiping about Indian stand-up comedy. So much for becoming global citizens.

Then came the shuttle. Chicago slowly disappeared and cornfields appeared out of nowhere. We wondered why the vehicle felt so fast until somebody remembered that the speed limits were now in miles per hour. I talked with the people around me for most of the two-and-a-half-hour ride and probably prevented two of them from sleeping. They may still be planning revenge.

Purdue did not arrive like some grand movie destination. The buildings simply became fewer until this new place was suddenly where I lived. Looking back, I think that was the correct entrance. A PhD may officially begin in a laboratory, but emotionally it begins when the familiar scenery goes away and you find out which parts of you have travelled successfully.

# 2

## Back to Survival Mode

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**L**ONG BEFORE AMERICA, almost every important phase of my education started with the same feeling: the people here know more than I do, the rules have changed, and maybe I have arrived in the wrong room.

My first school was in Mulund, where we lived with my grandparents. I used to win almost every competition: sport, speech, academics. You can probably guess that the competition was not world-class. No offence to them, but it is impossible for a person like me to win that many prizes otherwise! At five we moved to Thane, and Saraswati Secondary School was a serious step up. For the first couple of years I went into pure study mode just to regain my confidence.

The school was Marathi-medium until seventh standard. In eighth, mathematics and science suddenly switched to English. Put yourself in the shoes of a twelve-year-old boy: everything you have understood in one vocabulary now has to move into another language while the knowledge remains intact. It was crazy. Again, survival mode first. Learn a lit-

tle every day, pass the next test, and eventually the strange words stop feeling strange.

That pattern would repeat for the rest of my life.

Junior college took me to the other side of Thane and outside the almost entirely Marathi crowd of school. Hindi entered my life properly. Years later, it somehow became the language in which I wrote poetry best. After twelfth, most of my friends chose engineering. I chose basic science, partly to follow my father and partly because physics had made curiosity too difficult to ignore.

That meant forty-five minutes each way on Mumbai local trains. Those journeys made me tougher and much more culturally open. They also taught me that personal space is not a fundamental right; sometimes it is merely a beautiful theory. The personality I eventually carried to America was heavily seeded during those years.

Mumbai University added a one-hour commute and even less clarity about the future. A master's in physics does not simply land you a job, and the university name was not going to carry me by itself. A few dedicated professors motivated me, and through different connections I got projects at TIFR, the first genuinely famous Indian institution associated with my name.

The commute became ninety minutes each way. A full day could run from 7:30 in the morning to 10 at night. Still, the harder part was the crowd. These were easily the best minds in physics I had met. They knew so much and seemed ready to do much more. Back to survival mode.

Again: survival mode.

I tried for a year or two and never fully settled there. Then COVID happened, terrible for the world but, strangely, a turning point in my education. Purdue admitted me at

twenty-four. Imagine still turning your life around through education at that age, haha!

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At Purdue there was no longer only the “cream of India” to compete with. It was the international cream, haha. Man, that was scary during the first semester. I had never even stayed in a hostel in India for twenty-four years, and now I was in another country. All my labmates were American, and I was the first international student in the group. Coursework, teaching, research, cooking, money, stupid American weather, transport, and loneliness all became one large assignment.

When I say survival mode, I do not mean that every day was miserable. I mean the phase in which you stop expecting yourself to look impressive and just learn the next necessary thing. Hold on, improve a little, ask for help, come back tomorrow. Eventually the new place loses the power to frighten you.

That pattern had repeated my whole life: five minutes to school, then across Thane, forty-five minutes by train, one hour, ninety minutes, and finally eight thousand miles. Every phase first made me feel smaller and then made my world larger. Purdue was new, sure, but maybe it was also the same old story on a much bigger map.

# 3

## Too Much of Myself

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**D**URING MY FIRST TWO WEEKS in America, I compared everything with India: food, roads, houses, cars, manners, grocery stores, weather, family life, and even how seriously people took traffic rules. First-time travellers do this with great confidence after observing maybe twelve people.

The food was bland, obviously, but Indian grocery stores had almost everything needed to make food exactly as it was made at home. The missing ingredient was not always a spice. It was the room full of people. At home, cooking and eating happen around routines that overlap. Here, everybody returned at a different time and food often became only a tummy-filler instead of a mood setter.

Cars, big houses, and fancy gadgets are the things people in India talk about with “some day” in their voice. Here they were almost necessities. My professor could not believe I planned to manage without a car, even with free buses around Lafayette. Meanwhile, family time and relationships maintained by daily life, things we often treat as normal in

India, looked like luxuries here. Somebody had played an Uno reverse on the whole society.

I expected making friends in another country to be difficult. Turns out, you just have to start a dialogue. At bus stops, on campus, and around the apartment complex, I had meaningful conversations with people from six or seven countries within two weeks. Most people are curious. Nobody wants to start without a reason. If you can keep finding reasons, you can stay an extrovert almost anywhere.

Our first apartment supplied enough reasons. We hosted students whose leases had not started, and then a flea problem nearly pushed us out of our own place. We packed again, stayed elsewhere during pest control, took help from people, and later arranged a party for those we helped and those who helped us. It was fun, of course, no need to mention that. Sometimes a community forms because everybody's inconvenience becomes public at the same time.

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The strangest observation was discipline. They actually follow the rules! Who would have thought people might obey rules made to make their own lives easier? As a boy who had criticised Indian uncles for refusing to return a cricket ball after we entered their property without permission, the respect for privacy here was almost shocking. The manners were so consistent that I sometimes could not tell whether I was talking to a human or an automated voice. Both were equally polite.

The positive side of privacy was that nobody cared. You got your space and some more. But once society stopped judging me, I quietly took over the job. Now it was just me judging myself all the time, and boss, that is difficult to escape.

For the first time, I had too much of myself. I had always enjoyed solitude, but only in the necessary quantity. Here there was no family room to enter, no old friend appearing without a plan, no crowded train forcing human contact. The habits, interests, and emotions I thought were permanent started changing. There is no way to record your exact self on a particular day. You can access only the latest version and live with it.

That version had to cook, shop, clean, plan, and recover without the invisible infrastructure of home. Even enjoyment required planning. You wake up on Saturday and now you have to plan the weekend yourself? How ridiculous no?! A trip means schedules, messages, a car, ticket prices, and then remembering that everyone involved is still a student. Sometimes the big plan is cancelled before breakfast and a smaller one is negotiated by lunch.

The silence also amplified academic judgement. I was almost failing the mid-semester exams, research was not progressing, and teaching duties never ended. Things pile up and you notice only when they overflow. Confidence is crucial. If you do not hold onto it in time, the only place you will be able to “stand and deliver” is in a washroom!

Fortunately, I caught up and passed the courses comfortably. Research stayed hard, but America began to feel manageable. I knew where to buy groceries, which bus to catch, and whom to call when something went wrong. The comparison slowly stopped being India versus America. It became the person who had left India versus the person forming here.

Places matter, sure. But maybe their biggest effect is not how different they look. It is how much of yourself they force you to meet. Whether that is a good thing or not, I was still figuring out.

PART II

# Apprenticeship

*Most days, science is not the discovery of a new fact. It is the slow elimination of every reason you cannot yet trust what the apparatus is telling you.*

WEST LAFAYETTE, 2022–2023

# 4

## A Better Tomorrow, Booked

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**T**HE FIRST TRIP HOME began weeks before I reached the airport. Just knowing that I was going made the difficult days better. You will notice this in adult life: Saturdays are often better than Sundays. Not because the plans are better, but because Saturday still has the feeling of a better tomorrow. For the last part of that semester, India was my Sunday. The ticket itself was doing half the emotional work.

Lord COVID made sure until the end that I was not certain I could fly. Testing windows, lab hours, airline rules, and the uncertainty of results became more complicated than some quantum-mechanical calculations. Six hours before departure, the result finally came back negative. Schrödinger's cat was alive, at least for travel purposes.

I landed in Delhi thinking, *Yessss, I am back home!* Then I noticed I could not breathe perfectly. Pollution. Within minutes I had become the exact NRI I would previously have mocked, the one who leaves for five months and returns complaining

about air and noise. Trust me, though, it all faded once the familiar colony came into view. The buildings seemed to clean the air by themselves. When you go from point A to point B, you understand how far you went only after coming back to A.

Home received me without asking for proof of success. This may be the most generous and most dangerous thing about parents:

*If you go out and fail at a hundred things, you still come home a superstar in the eyes of your parents.*

At Purdue, everything was measured: grades, data, teaching, competence. At home, you could be maximally irresponsible and still get away with it. Jet lag ate half the visit. I fell sick. I used all my negative thoughts to keep testing negative for COVID. My friends rearranged their routines around me, and my parents tolerated the demands of a returning child pretending to be an adult. It is good to be selfish sometimes, no?

The trip was short, because every trip home is shorter from the inside.

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Coming home does not restore an old saved file. Time has continued without your supervision. Friends have new routines and stories in which you appeared mostly through a screen. Parents are the same people and also a few months older. Mumbai looked familiar, but I was looking at it with eyes trained by another place. Had home changed, or had I? Obviously both, but the second answer was more uncomfortable.

Before leaving again, I wanted an impossible arrangement: freeze one part of the world while fast-forwarding

the other. Let me grow, but do not let my parents age. Let friends advance, but keep my place in their daily lives. Let the PhD take years while home stays untouched. Unfortunately, time flows for everyone. Do not listen to Einstein and his relativity; it does not help here.

Still, the first trip was a success. Leaving India had stopped feeling like one irreversible act; I could cross the distance in both directions. Home was no longer simply behind me and America ahead. Each place now sat at one end of a journey, and reaching either meant leaving the other. I hoped later trips would feel easier and nothing important would change. Nothing! That hope was not very realistic, but it was useful while boarding.

# 5

## Coherence: Broken Again

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**B**Y THE FALL OF 2022, something epic happened every morning: I woke up at 7:30 without an alarm. A digital clock sat directly across from my bed, and irrespective of when I slept, the first sight was almost always the same four digits. No, I had not secretly set an alarm. My biological clock had apparently accepted the routine more completely than I had.

Chores by eight. Breakfast alternated between banana milkshake with eggs and ginger tea with a chicken sandwich. Check the weather before choosing clothes, because it could change fifteen or twenty degrees within a day. Stupid American weather! Then bus, lab, science, bus back around seven, and cooking dinner every evening, which many students found surprisingly ambitious. One episode or a chess game, maybe an hour of study, and sleep by eleven. That was it. Almost the same every weekday.

The funny part was how easily this “coherence” broke. At ten in the morning I might be fully ready for an ideal day of work. Boom! A photograph from home. A message from

school friends. An invitation to some campus event. Each one immediately sounded more fun than the schedule in my head, and now all those thoughts travelled with me through the day. Coherence gone.

On another day, when nothing in the lab worked, the same messages were beautiful. They rescued the day. Same photograph, same friend, completely different effect. The power of relativity is intense, and apparently Einstein does not even have to be invited.

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My first individual project tested that coherence properly. I had to build a radio-frequency antenna for a particular transition in trapped lithium atoms, part of a system for state-selective imaging. The description sounded impressive. The work felt like electrical engineering handed to someone trained in physics, and I struggled with it enough that I went to my adviser to discuss changing groups. His answer was neither a speech nor an empty reassurance:

*“I think you can do it. But I can help you find an easier lab, if the variety of projects here has become too much.”*

The word *easier* did its work. Nobody wants to leave because somebody offered to find an easier lab! I stayed.

Research has no reliable scale for difficulty. A problem may be hard because you are learning, the equipment is wrong, the idea is wrong, nobody knows the answer, or because you made a stupid mistake on Tuesday and will discover it three weeks later. Emotionally, all five feel almost identical. I built, measured, failed, swapped components, learned enough engineering to be slightly dangerous, and built again. By December one prototype worked. Fancy scientific language aside, that felt very good.

Beyond the lab, Indiana turned colour. The fall was so beautiful that I came to believe everyone on earth should see it once: trees holding several seasons at the same time, a bright campus bracing for the cold, skies wide enough to make a daily walk feel briefly cinematic. Sometimes I left the building at a random hour and walked with no purpose, and a thought would arrive with surprising force: *this was the dream*. A year earlier I had wanted to be somewhere nobody knew me, building an identity from nothing, and now I was living it so continuously that I had forgotten to notice. The person inside a dream still has groceries and bad weather and unfinished work; achievement does not glow from every angle while it is being lived. The recognition never lasted long. It did not need to. It gave the day enough energy to keep going.

Earlier I believed that critical thinking was simply a blessing. By then I was not so sure; sometimes the happiest person in the room seemed to be the one able to think the least! Still, thinking was also how I turned this repetitive life into something worth writing about. If you are underthinking, read. If you are overthinking, write. I had heard that line somewhere and was happily using it as permission for both.

# 6

## The Atom Appeared!

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**I**N EARLY 2023, A WINTER SCHOOL in Arizona gave us a fresh start. My senior labmate David and I spent a week learning from some of the best researchers in the field, in a beautiful deserted state where the scientist inside me breathed fresh air and the Indian foodie suffered daily. Fair exchange, I suppose.

Being in that room gave me a strange confidence. It did not mean we were already successful, but we had reached a place where important scientific conversations were happening and had been allowed to join them. That has to mean the road is at least roughly correct, no? It is all about getting the approach, man. Once you have it, the rest starts falling into place.

Back at Purdue, everybody focused on the first proper result for the lab. We were trying to trap, cool, and image one lithium atom. That sentence is short; the apparatus took years. You do not see an atom like a tiny ball. You collect its photons on a camera after lasers, magnetic fields, vacuum systems, electronics, optics, and software all agree to behave

at the same time. If that sounds difficult, good, because it was.

Then the atom appeared!

We had trapped and cooled a single lithium atom from a hot cloud, for the first time in our lab, and imaged it with the best accuracy in the world for that system. That ought to feel good, eh? It did. The result came from my adviser's vision and the collective perseverance of the group: years of components, late evenings, failed alignments, rewritten code, and many boring decisions that we now had permission to call important.

On the camera, the evidence looked small: one distribution for no atom and another for one atom. But that separation carried the weight of the whole apparatus. We started writing and submitted the lab's first paper by the end of spring. Very satisfying!

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After a result works, memory becomes dishonest in a useful way. Failures turn into steps and delays become necessary lessons. The final story sounds much cleaner than the actual research. It is worth remembering that while we were in the middle, we had no idea whether the ending would arrive.

After the paper, each student received an individual project and we began working in an "Americanised" way, everybody chasing a specialised American dream. The research can be boring, but you describe it in fancy language to stay motivated!

American labmates also made cultural differences measurable. My entire undergraduate education had cost roughly \$1000 and graduate education around \$500. One labmate, carrying loans above \$100,000, joked that after hearing this he almost wanted to hit me. Lucky guy, he called me. Some-

times you appreciate your own system only after watching somebody react to the numbers.

That summer I started teaching atomic physics online to master's students at Mumbai University. I had wanted to contribute something to people on a similar journey. Why not donate money? Well, the only considerable income of a PhD student is knowledge; by God's grace, we are below the poverty line in most other resources! So time and patience were what I could give.

Teaching also exposed holes in my own understanding very efficiently. People say the best learning happens when you teach, and annoyingly they are right. Research had shown me the satisfaction of making one atom visible. Teaching showed me what it feels like when an idea becomes visible to another person.

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Summer days began early because the sun was always competing to wake up first. I rode my bicycle to the lab through a small town where you could still hear nature, people waved back, and cars respected the cyclist. Who needs a car with such a ride? Philosophically, the lab was also physically downhill from my house. On difficult research days, life followed the geography a little too accurately.

At twenty-seven, career questions had started sharing space with relationships, family, and where a future should be built. Friends were marrying, returning to India, staying in America, or making long distance work somehow. Our generation balances two careers, two geographies, independence, family values, ambition, and sacrifice. No pressure!

I did not have an answer. My method was only to make the best of the present: write because I loved writing, teach on Saturdays because I loved teaching, go to the lab because

despite everything I loved research, call my people, and stay available. Maybe that impact is what keeps us doing the silly tasks called work and chasing the stupid pieces of paper called money, so that in our spare time we can do a few things that make us feel alive.

The first atom was a scientific milestone. It also made one general point very real for me: something invisible can become visible if enough scattered efforts finally agree. We all try, and we keep trying.

PART III

# Entanglements

*I was not half-present in two places. I was becoming a person made by the movement between them.*

TWO HOMES, ONE EXPERIMENT

# 7

## Which One Is Home?

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**B**Y DECEMBER 2022, my American life had improved greatly. Instead of fixing everything from cooking to my emotional state, I could focus on research. I had completed a course called *How to Live Abroad* without ever receiving grades, and I felt strangely accomplished. The only major problem remaining was physics, which was at least the problem I had travelled there to solve.

I packed gifts and cleared some mental space for new memories. On the flight home, the World Cup final between Argentina and France was live on every screen. Goosebumps! Different sections of the flight cheered for Messi and Mbappé, and thousands of feet above the earth, people from everywhere were temporarily united by one football match. Sport does this without asking for passports or explanations. Argentina won, and naturally I took it personally.

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At home, ten of us in our mid-twenties decided that our demanding lives needed a spiritual trip to Varanasi. Our par-

ents had doubts. We also had doubts, to be honest, but went anyway. At the Ganga ghats and Kashi Vishwanath temple, we found practices and stories that had existed around us since childhood but which we had never properly examined. Of course, as freshly manufactured NRIs, we also ate everything we had missed and complained about pollution. It takes only a few months abroad to become slightly annoying!

Varanasi did not solve our questions about careers, relationships, or the future. It did something else. It put our confusion next to a city much older than all of us, and suddenly every urgent decision looked a little less urgent. Sometimes scale is enough.

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The last night at home undid the composure I had kept the whole trip.

Goodbyes never get easy. I had assumed the second one would hurt less because we had practised. Wrong. On the last evening, I could clearly imagine how my friends' lives would develop over the next year while I participated mostly through a screen. My family was growing and getting old at the same time. Why do parents have to get old along with us? Everyone wonders this and nobody has a useful answer.

I had held my tears for most of the trip, but that night I could not. We cried together as a family and then prepared ourselves for the next year with, of course, a smile. There was no tragedy; I was returning to an opportunity we all valued. That is exactly why it was difficult to explain. You can be lucky and sad at the same time. So back I went to the stupid yet opportunistic work life, to chase my American dream until the next visit.

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Living between countries changed the word *home*. At first, home was Mumbai and Indiana was simply where work happened. Then the Indiana apartment collected routines, friends, cookware, failures, and jokes, and became a working-home. Mumbai remained the place where I could be maximally irresponsible, although now every visit had a departure date attached.

For a while I thought one of these had to be the real home. Why? A person can belong to more than one place, just not in the same way. Mumbai held the history that needed no explanation. Indiana held the future I was trying to construct. One knew me before this ambition; the other knew me through it.

The distance could be measured in miles, flights, time zones, missed events, and meals shown through video calls. But both places could still exist inside one day. That is why one photograph from home could completely break my coherence in the lab. I was not exactly half-present in two places. I was becoming somebody shaped by travelling between them.

But let us not make this sound too beautiful. Two lives running in parallel also mean missing things. A wedding attended through a phone. A friendship changing shape while you are absent. Parents and grandparents ageing during a winter you spend aligning a laser. You can fly home, but you cannot fly back into every ordinary day that happened without you.

Nobody tells you clearly that leaving is also a slow kind of mourning. You do not notice it every day because you are busy building the life for which you left. Later, the missed parts become visible. The privilege is real, and so is the price. I no longer think the task is to choose which home is real. The task is to carry the distance without pretending it is free.

# 8

## When My Parents Entered My World

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**T**HERE ARE EXPERIENCES that are too large to explain efficiently. My parents' first trip to America is one of them. So let me start the way my mother starts every journey: Bappa Morya.

We bought the tickets almost a year in advance. My father had never travelled outside India, and as the date came closer, every question about airports, immigration, and the long flight increased the household anxiety. But they trusted God, each other, and the Emirati horses pulling the palanquin. After their small Sinbad voyage, they reached the port of Chicago.

I drove two hours to collect them. That detail mattered to me. On childhood trips, I had simply followed them without knowing the route. Now they did not know the road and I was responsible for showing it. No birthday had made me feel as adult as driving my parents away from that airport.

We left Chicago. The skyscrapers slid behind us and the American landscape became the one I actually knew: highway, open field, wind turbine, long distances between buildings. My father looked back at the city skyline and said, "*Aaplya Mumbaichya imarti tichbhar vaatatil*", "next to these, our Mumbai buildings would look tiny." Then the skyline was gone, and there were only windmills, and he said nothing and simply looked. At the apartment, ready-made food welcomed the "guests." Then, slowly, we turned the flat into a home.

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Jet lag put them into an afternoon sleep from which they had no intention of returning. Now it was my job to keep *them* awake, organise the day, explain appliances, and reassure them that the silence outside did not mean something was wrong with the city.

They met friends, labmates, and relatives who had previously existed for them as names or rectangles on a screen. Watching the groups meet felt like two cinematic universes crossing over. Their presence changed the apartment. Meals became social again. During one quiet Sunday with cousins, I forgot for a while that I was abroad.

America seemed to have more time. In India, twenty-four hours often fail to contain one day; in Indiana, retirement could be practised properly. The strongest evidence was my mother going a full month without asking for Zee Marathi. The sun rising in the west would have surprised me less.

More importantly, they saw what no phone call could show: the road to the lab, the grocery store, the scale of the university, the friends who had helped, and the quiet in which I had built a life. For years they had supported an ab-

straction called “PhD in America.” Now it had rooms, faces, distances, and a bicycle route.

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A month passed at the speed of an hour. At the airport, the direction of the separation had reversed: I was no longer leaving their world; they were leaving mine.

Parents first teach you to imagine a world larger than the one you can see. Showing them my world later was deeply satisfying, not because America was some superior destination, but because the imagined future had become a place where we could stand together.

Their visit also confirmed something simple: no matter how old we become, we become children again around our parents. The dependence only changes shape. As a child, my safety rested in their competence. As an adult, more and more of my happiness was hiding inside theirs. The ground beneath us can change; the hand above the head remains theirs.

After they left, the apartment looked exactly the same and felt completely wrong for a few days. Then I went back to work, because what else do you do after a meaningful goodbye? But now the two worlds were no longer separated only by imagination. My parents had travelled the Indiana roads, sat in the apartment, met the people, and lived inside the ordinary life for which I had left home. The distance between our two homes was finally something we all understood.

# 9

## Who Says Achievements Need to Be Big?

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**I**N JANUARY 2024, one month later than planned, my on-line chess rating crossed 2000. I was so thrilled that I could not sleep. It is stupid that one random number gives you so much excitement and self-validation, but there we were. I explained the rating system to friends who do not even care about chess, built an unnecessary cache in their minds, and then announced the milestone like a major scientific result. What is the point of personal goals if you cannot make a big deal out of them with your people, right?

Around the same time, a school crush from years back confessed that she had felt the same way. A third-year PhD student instantly became a schoolboy with very delayed experimental confirmation, and I bragged to my boys for an unreasonable amount of time. Who knew a PhD student could still get that excited about schoolyard romance? The inner child does not care much about your academic progress.

Then I got an American driver's licence. People here get one at sixteen; I got mine at twenty-seven. Big deal, right? Actually yes. Who decides the age at which you are allowed to be happy about something?! The licence meant I could drive my parents from the airport. I was so relieved that I took the weekend off, which PhD students will recognise as another achievement of similar difficulty.

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I started learning classical music that spring. Until then I had mostly sung Bollywood songs, so classical music was completely unknown territory. A concert at Purdue struck a chord that I genuinely did not know existed. If music ever connects you with someone or something beyond yourself, cherish it. Those bonds can last.

And I learned to make rotis! Trust me, it takes a full day to prepare yourself mentally for this activity on a weekend. With serious remote coaching from my mother, I tried. The rotis were round enough that people ate them with a humming sound, which is the only standard that matters.

Years earlier, I loved a non-vegetarian thali from a Mumbai place called Suwidha: chicken curry with hot rotis. Recreating something similar in Indiana put a slice of home on the table. I slept like a baby that afternoon, full and content.

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The last new thing I did that spring was take my own religion seriously. When you land in a foreign country you either cling to your culture harder or drift from it entirely, and for me drifting was never an option; I had been going to the shakha for two years, mostly for the traditional games we had played back home, and along the way I began reading

about practices I had previously accepted without examining.

Hinduism is endlessly mocked for having too many gods, but consider that in physics we are perfectly comfortable with multiple forms of energy, multiple fundamental forces, a whole zoo of elementary particles. If that multiplicity is allowed in our description of the physical world, why is it foolish to keep several focal points for spiritual energy: Saraswati for learning, Ganesha for beginnings, Shiva for power and transformation? This is not inconsistency. It is flexibility. And the other charge, that we look for God in stone. Well, do we not all keep photographs of the people we love around the house? The object is not confused with the person; it focuses memory and relationship. An idol is the same kind of thing: a place to gather attention each day and point it toward your own becoming. Religious practice, in the end, should serve your betterment, not the other way around. This was not a proof of religion by physics. It was a way of holding my own inheritance without embarrassment.

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None of these things will appear on a CV. Maybe that is precisely their value. Graduate school trains you to measure publications, talks, awards, years, and offers. But what about learning to cook every day, holding friendships across time zones, asking for help, recovering from panic, noticing the fall, driving to an airport, or building a cultural life on purpose? Those things also happened during the PhD. Institutions just do not have a box for them.

One person's licence is routine and another's is freedom. One dinner is just dinner; another is a reconstructed home. A random number on a chess server can hold a year of losses.

These achievements look small only when viewed from outside.

Maybe they do not replace ambition, and they should not. But they give meaning to the individual doing all that ambitious work. These are the things that help us fall forward, right?!

# Life, According to Quantum Physics

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**A**T SOME POINT IN THE PHD, physics stopped being only the subject I studied and became the language in which I compared everything else. This is probably an occupational hazard. Spend enough time thinking about tiny particles and soon you start explaining family, attention, and decisions with quantum mechanics! Some of these analogies are surely stretched. I am offering them as metaphors, not scientific proofs, so bear with me and decide which ones survive.

**The observer effect.** In quantum mechanics, measuring a system can change it. In life, observation is not passive either. Every time we interact with someone, we alter their state a little and they alter ours. Your presence in somebody's life is participation, not just observation.

**Collapse.** Before measurement, a quantum system may be in a superposition of possibilities. A measurement gives you one definite outcome. Choices feel similar: every decision turns many "what-ifs" into one "what is." Until you decide, life is a cloud of maybes. Once you choose, you have to live forward from that result. Scary, but also useful; imagine having to occupy every possible life simultaneously!

**Coherence.** A single particle holds its coherence far longer than a system of many; scale brings noise. Our minds are no different. The longer you can sustain one clear line of thought without scattering it, the better the result. Focus is the superpower most people keep meaning to develop.

**Uncertainty.** Heisenberg's principle says you cannot know a particle's position and momentum perfectly at the same time; chase one and the other blurs. In life, the tighter you grip control, the less freedom you feel. Loosen your hold on certainty, and another dimension quietly opens.

**Resonance.** When two systems have matching frequencies, they exchange energy efficiently. We even say two people are on the same wavelength. But a little mismatch keeps a dialogue alive. If everybody agrees on everything, what will they talk about? So if you want to stay social, maybe disagree a little. Not too much, boss, just enough to continue the conversation.

**Entanglement.** Entangled particles have correlations that survive distance. We have a human comparison ready: family. Across time zones, moods and fears still travel. Obviously this is not literal quantum entanglement, before a physicist attacks me, but emotionally the analogy is difficult to resist.

**The basis set.** Every quantum state can be expressed in a chosen basis. Our opinions also sit on foundational beliefs that we may not notice. The basis can change, though, and that is the interesting part. If you are arguing with somebody, the conversation can go somewhere only after you understand what their basis is. Otherwise you may both be correct in different coordinate systems and angry for no reason.

**Energy and evolution.** The energy of a physical system determines how it evolves in time. Your present energy (mental, emotional) sets where you are going next. It sounds obvi-

ous stated plainly. It stops being obvious at two in the afternoon on a difficult Tuesday, after six hours at a failing experiment.

**There is no zero.** Even in a vacuum, the quantum fields buzz; nothing is ever truly empty. There is no such thing as nothing happening. The quiet moments are full of background activity, things being processed, potential gathering for the next event. Stillness is not emptiness. It is preparation.

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In the end, quantum physics is definitely still about particles, so let us not get carried away! But it also gives us a fun vocabulary for participation, uncertainty, and connection. We make measurements, choose among possibilities, lose coherence, find it again, and remain connected to people who are far away. The universe does not reveal everything at once, and neither do we.

*One experiment, one conversation, one moment at a time.*

PART IV

# Becoming

*We need events that do not advance the work, in order  
to remember why advancing the work matters.*

INDIANA → BOSTON, 2024–2025

# 10

## The Lab Stays. We Don't.

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**O**N THE EIGHTH OF APRIL, 2024, the world went dark in the middle of the day. The solar eclipse! Trust me, knowing the science did not make it less mesmerizing. Imagine everything around you becoming dark and one beautiful ring remaining in the sky, probably the largest ring any of us will ever see.

Our whole PhD gang watched with the astrophysics community, their telescopes and commentary giving us a perfect view. For three minutes, some people shouted and others tried to photograph the darkness. As an aspiring scientist, it felt especially satisfying. The stars literally aligned and reminded us that the science we study is describing a real universe. These are the moments that make the PhD journey feel worthwhile.

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That summer, the senior-most student became the first person to graduate from our lab. He had been one of the first American students I spoke with in 2021, and his welcome,

along with our postdoc's, was part of why I joined the group. We looked back over three years of research and enjoyed the luxury of nostalgia while still standing inside the lab. Then he said:

*"It's so weird that after five years, you move on, but the lab stays right where it is."*

Such an interesting thought! The optical table, cables, vacuum chamber, and unfinished tasks wait in the same places every morning. The people pass through. A project that once occupied your entire life becomes a paper, a folder, or an apparatus inherited by somebody who did not see it begin. Memories are photographs, not videos. We keep a few frames and call them five years.

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Around the same time, I attended two American weddings for labmates. The ceremonies looked familiar because movies and television had trained us well, but the two weddings were completely different. One was carefully arranged, outdoor and child-free, designed as a picture-perfect memory. The other was religious and relaxed, with families and children doing their own things. Both had websites and gift registries. You clicked one selected gift and it arrived at the couple's house with your message. Such an efficient algorithm, indeed reflecting the American way!

India also won the Cricket World Cup that summer. It happened on a Saturday morning here, and the whole weekend felt successful before it had properly begun. Most Indians slept better after that victory. Our current heroes had finally lifted the trophy after enough heartbreaks, and the inner child was very satisfied.

An eclipse, two weddings, a cricket victory, and a graduation do not form a clean scientific dataset. But all of them interrupted work and reminded me why life cannot be measured only by how much the project advanced. The universe worked without my troubleshooting. Friends built lives beyond the lab. A childhood dream in cricket came true. One student left while the apparatus remained.

One day I would also leave and somebody else would inherit the urgent problem on my table. When is the correct time to look back and enjoy the nostalgia? Before leaving, during the goodbye, or years later? I do not know. Everyone finds that answer separately. The lab stays. We do not. That does not make the years less meaningful; maybe it is why we should notice them while they are still happening.

## Boston! Finally, a Job

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**B**OSTON ARRIVED with fall colours and, for the first time in my life at twenty-eight, a job! Technically it was an internship, but after nearly a decade as a student I was going to call it a job. I moved from academia toward industry, from small-town Indiana to a proper city, and from studying quantum systems toward helping build machines that use them.

For the first week, while my work authorisation was processing and I was “legally unpaid,” I explored the river by every possible mode: walking, running, and biking. The sunsets reflected in the water with a skyline behind them and gave a strong Marine Drive feeling to the Mumbaikar inside me.

Public transport was another pleasant surprise. Tap-and-pay subway and buses connected even places twenty-five miles away. After living in parts of America where you are finished without a car, this felt refreshing. People say Boston has a European vibe; half of that is surely the transport, old houses, and streetlamps. A proper city makes everything ex-

pensive, including people's time, but it also gives you other lives to look at while living your own.

Setting up a new apartment is painful at any age. You plan a hundred things, order a thousand, and by day five become semi-functional. Luckily, I had friends and family nearby. My cousin lived four blocks away, which produced many home-cooked meals. There were hikes, a Marathi play, chess with colleagues, and busy weekends. My adviser once joked that I have more connections in America than he does. Boston provided supporting data.

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At three in the morning on a Sunday, my phone rang. I kept the volume high because living alone had trained me to treat availability as a safety system. It was my roommate, calling from elsewhere in the duplex, whispering:

*"There's someone in our house. Maybe a homeless person. I think we should check."*

Man! I hope you never experience the chills I got in that moment. I stepped into the hallway and asked how he was so sure. He had seen a large man looking into our rooms, and none of the bedroom doors were locked.

We debated calling the police. My roommate, braver or stupider than me, insisted on checking downstairs. We took a rod and flashlight and walked down slowly. The back door was half open. Nobody was there. Only a few drops of blood remained on the kitchen floor.

We locked everything, messaged the others, and told the landlord. By the next day, the likely explanation was that another roommate, returning in an altered state, had left the door open. We changed every lock. I installed a camera and put rods in the window tracks.

Still, fear took longer to leave than the intruder, if there had been one at all. For a student abroad, this is a special nightmare: the people you would normally call first are thousands of miles away. Later you say, “Whatever doesn’t kill you makes you stronger.” In that moment, trust me, the sentence is completely useless. It remains one hell of an experience to not remember.

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The work itself was extraordinary. I worked more than ten hours on many days, but it did not always feel exhausting because it aligned so closely with my PhD research: quantum computing, building machines based on principles I had spent years studying. Once again I had entered a room full of people with frightening expertise. School, university, TIFR, Purdue, and now industry: survival mode knew the route by then.

The quantum industry had a funny mixture of confidence and uncertainty. Scientists and investors talked about a revolution, while nobody knew which architecture, company, or timeline would survive. Maybe the dream would burst like a bubble. Maybe it would transform the world like AI after COVID. Nobody really knew, including the people paid to build it.

The PhD had not taught me to predict the future. It had taught me to work while the answer was unavailable. So without demanding certainty, let us ride the tide, shall we?

# 12

## Change Is the Only Constant

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**A**T THE EDGE OF COMPLETING THE PHD, my thoughts arrived with more diversity than ever: nostalgia, fulfillment, excitement, gratitude, and some confusion, obviously. But the strongest one was familiar: *change is the only constant*. I had used those words as an Instagram caption during my first week in the United States. Back then they sounded like a nice sentence. After the PhD, they felt experimentally verified.

Every stage had first disturbed my confidence. Mulund to Thane. Marathi to English in the middle of school. Junior college, crowded trains, bachelor's, master's, TIFR, Purdue, and industry. At every transition, the talent around me appeared to increase and everybody seemed to own some vocabulary or certainty that I lacked. Back to survival mode each time.

This is not an argument that everybody should suffer permanently. Survival mode is the phase between two comfortable versions of yourself. Your old methods no longer work

perfectly and the new ones are not yet natural. So you hold your competitive spirit through the high tide, learn one thing, ask one question, and return the next day. Small improvements compound quietly. Years later, people may call the result talent and completely miss the panic that helped build it.

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Nearly thirty years of education is longer than anybody would recommend. Was it worth it? You decide. If education is only a transaction for employment, my route was spectacularly inefficient: long commutes, financial limitations, exams, anxiety, difficult research, and a doctorate completed around thirty. There were certainly shorter ways to start earning.

But education changed much more than my employment. Marathi-medium school became a base from which other languages could grow. Mumbai trains expanded my tolerance and culture. A few professors at imperfect universities showed me the force of good teaching. TIFR showed me serious research. Purdue made science international and converted independence from an idea into a daily routine. The lab taught me to remain with a problem that did not care about my confidence. Teaching sent some knowledge back to where it had started. Industry connected one experiment to a much larger ambition.

A CV draws this as a smooth upward line. It never felt smooth while I was inside it. The real education was rebuilding the person doing the learning every time the environment changed.

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I expected finishing to provide clarity. It mostly gave me a more advanced version of confusion! The difference was

that I no longer needed certainty as proof that I belonged. A career can change, a company can fail, a field can turn, and the next phase may again begin in survival mode. After this many trials, that possibility no longer sounds like evidence of failure.

The lab will stay. Mumbai will continue without waiting. Boston may become a memory, a home, or only a chapter. Parents will age. Friends will build lives whose daily details I cannot always share. New people will enter these places, change them, and leave their own traces. This is not a comfortable thought, but comfort has never stopped it from being true.

Still, change does not mean that nothing remains. You carry things forward: the language you once struggled with, a friendship started by complaining on a flight, the experiment that worked after you nearly abandoned it, the road you later showed your parents, the habit of waking without an alarm, and the willingness to begin a conversation.

In the year I turned thirty, I could finally say that my formal education was ending. It had been long, longer than anyone would aspire for. But one thing was clearly not ending: the learning. Fortunately or unfortunately, that is the only truth!

# Epilogue: The Latest Version

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IN MY FIRST WEEKS IN AMERICA, I wrote that there is no way to document your exact self at one moment. Habits, interests, and emotions keep changing, so you can access only the latest version and live with it.

This book is my attempt to argue with my own sentence. Very on-brand, I think.

I cannot recover the earlier versions completely, but they left records. One panics while Mumbai disappears below an aeroplane. One compares every American habit with India. One nearly fails his courses in a quiet apartment. One hears his adviser use the word *easier* and decides to stay. One sees a single atom appear on a camera and cannot sleep properly from excitement. Another drives his parents from Chicago, walks beside a river in Boston, and starts calling an internship a job. All of them are me. None is the final version.

For a long time I assumed life should move toward stability. Now I am not so sure. No, I am not suggesting changing careers daily or marrying a hundred people! But destinations become ordinary surprisingly fast. Most of the fun, frustration, and growth happen while approaching them. Goals are necessary mainly because they build journeys.

Confusion makes us ask questions. Differences keep conversations alive. Distance makes certain forms of love visible. Failure tells you what to measure next. Maybe stability is not the final achievement we imagine. Staying interested, changing phases, and remaining available to people may be enough. Really? Not sure. But it is not complete nonsense, right?!

I have stopped trying to subtract what this journey cost from what it gave. The two came together. The gain was often louder while events happened, and the loss sometimes became louder later. Both are true.

The experiment continues, and unfortunately the scientist is also the subject. I observe, participate, lose coherence, recover it, and modify the apparatus whenever possible. The distance between two homes was not only the thing separating them. It also built the person travelling between them.

There will be another version after this one. Let us see what he thinks, no?

*One experiment, one conversation, one moment at a time.*

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*Everything can be fixed.  
What cannot be fixed can be lived without.*

# About the Author

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**S**AUMITRA PHATAK grew up in Thane, Maharashtra, and completed his bachelor's and master's degrees in physics in Mumbai before joining Purdue University's physics PhD programme in 2021. His doctoral research is in ultracold atomic physics, the cooling and imaging of single atoms in optical tweezers, toward the assembly of ultracold polar molecules. He completed a quantum computing internship in Boston in 2025.

He has been writing about life, science, and the spaces between the two since 2021, in the series *Curious Writings*. He still wakes up without an alarm.

<https://saumitraphatak.github.io/curious-writings>