


Uncertainty

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## 1. EXT. COURTYARD. NIGHT (FLASH FORWARD)

 The film opens with a shot of the night sky. The stars are bright, surrounded by deep black.

NATHAN (V/O)

The stars are so lonely. The spaces between are so empty. And we're tiny, spinning between them. We don't matter. The thing that hurts people the most is the fact that the universe is not built to be fair. We bring our human assumptions to an indifferent space. And it's that difference, between reality and the world we've built in our heads, that destroys people.

 We now see Nathan's face. He is lying on the paving stones of a courtyard, staring up into the sky. A tear slides down the side of his face. Then his face crumples as he struggles to contain a sob.

## 2. INT. NATHAN'S ROOM. MORNING

We see Nathan's desk up close. Scattered across the desk are dozens of pages of scribbled physics equations and mathematical working, with a lot of crossing out and unintelligible writing. The sun peers through the curtains onto Nathan's sleeping face. A magpie warbles outside.

The rest of his tiny room is untidy, with clothes, books and paper scattered across the floor. A pot plant rests on the floor, with a watering can next to it.

Nathan turns in his sleep and bumps his wireless mouse, lying on the bed next to him. It wakes his ancient laptop. On the screen is displayed a letter of rejection from the University Scholarship Committee.

An electronic song suddenly blares from his phone. Nathan snaps awake, and after a groggy moment leaves for the shower.

## 3. INT. BATHROOM. MORNING

There is a shot from Nathan's perspective. He is looking at himself, wearing a towel, in the mirror, which is blurred because he is not wearing his glasses. He places a contact lens in his eye, blinks, and he comes into focus. He then proceeds to rub shaving lotion onto his face.

#### 4. INT. BUS. DAY

Nathan is sitting on the bus, scribbling furiously at a physics problem, scratching out lines and writing down algebra. The sun shines brightly through the window.

#### 6. EXT. UNIVERSITY. DAY

Nathan walks through university on his way to a lecture. He walks quickly, determined to get there on time, past groups of friends talking to each other as they walk.

#### 5. INT. LECTURE THEATRE. DAY

Nathan is sitting in the lecture theatre, note pad out, taking copious notes from the screen.

LECTURER

...eventually, the star loses its internal heat and collapses under its own pressure, into a shadow of its former self...

#### 6. INT. RESTAURANT. NIGHT

A fast food restaurant, serving burgers and alcoholic drinks. The dining area is noisy, crowded, and dimly lit. There is a pool table, one of the restaurant's gimmicks, in the centre. A couple of customers are preparing to begin a game. In the servery, the employees are working hard.

Nathan enters through the front door and walks past the pool table. We see the break as a game begins, balls bouncing across the table. The red 3 ball is sunk immediately.

Cut to Nathan in full swing at work. He is on the chip station, and is rapidly placing load after load in the fryer, packing ready chips into cups, and taking them over to the wrap station. As he works, he is chatting with ANNA, who is working at the bun station, reading docket, placing buns in the toaster, calling out chip orders to Nathan, and placing them on the dress bench when ready. The restaurant is very loud with staff shouting, the bubbling of the fryer, the clanging of tongs.

NATHAN

The universe really is incredible, you know.

ANNA

No arguments here. Reg chips down.

Nathan places a vat of chips into the fryer.

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NATHAN

No, it really is. It's been around for thirteen billion years, expanding from a single point; stars and planets and galaxies and supernovae... gradually enriching open space with the elements. Providing everything life needed to pop into existence. And then another four billion years of evolution, and here we stand!

ANNA 

Something like that. You glossed over a few crucial parts. Snack chips down.

Another vat of chips.

NATHAN

Sure, sure. My point is, it's almost like the universe is meant for us, meant to create intelligent life. It provided everything; the tools for our existence and everything we've built.


ANNA

(Concentrating) Uh huh.



NATHAN

There are things that can only exist because we do, materials that don't occur naturally. Like intelligent life brings out the universe's full potential. Like it wants us to succeed.

### 7. EXT. STREET. NIGHT

Nathan walks home along a dark street. The infrequent street lamps cast long shadows. He oks up to see the stars again. He gazes in particular at Jupiter, the brightest currently in the sky. It looks lonely, surrounded by a dark patch.

### 8. INT. NATHAN'S ROOM. NIGHT

Nathan returns to his ro  and checks his email. He finds a letter of rejection from ntrelink, informing him that he doesn't qualify for Commonwealth support. He slaps the desk and growls in frustration.

## 9. INT. NATHAN'S ROOM. MORNING

We see the same pool game from before. The balls follow exactly the same paths as they bounce off each other. The sound is muted, with the sound of the collisions emphasised. We see the same collisions from different angles. As the red ball is sunk, Nathan's alarm sounds and we cut to his room as his eyes jerk open. He appears more lethargic as he rises. Outside, the sky is grey.

## 10. INT. BATHROOM. MORNING

Nathan puts his contacts in, the same as before, and rubs his eyes. We can see in the mirror that they are red. He touches the hair on his chin, which is starting to look rough, but decides to ignore it.

## 11. INT. LECTURE THEATRE. DAY

Nathan is sitting in class again, with shadows under his eyes. Written on the board are Newton's laws of motion, the formula for gravitational attraction, and Maxwell's equations of electromagnetism. He is attempting to take notes. Nathan's eyelids droop lower and lower; they fall shut, and he slumps forward, but he jerks awake.

LECTURER

...If the laws of physics are understood correctly, all the information about a system is known, then its behaviour can be predicted perfectly.

Nathan sits up, eyes wide.

LECTURER

(beneath Nathan's V/O) That's a classical interpretation, at least...

NATHAN (V/O)

This has been at the back of my mind for a while, but I only just realised what it means. If the laws of physics are predictable and always give the same results, then there is only one possible outcome for any given event in a given system. That... there is no free will. The events of the past and present are set. The future is unchangeable.

His face is horrified.

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At the end of the class, Nathan leafs through the marked tests on the desk at the front. He finds his test, with a mark of 52. His face is marked with disappointment.

NATHAN

All that study...

**12. INT. RESTAURANT. NIGHT**

Nathan is working again, this time on the grill station, flipping meat and taking it over to place in burgers. Anna is wrapping. They are talking loudly, over the sounds of the restaurant.

NATHAN

There is no choice.

ANNA

That's a lot to drop on someone at work. Next is a Crispy.

Nathan transfers the meet for a Crispy from the grill to a waiting burger. He continues to talk while tending to the grill, arranging and flipping the meat.

NATHAN

You know how the brain works, right? It's a system. It's a series of electrochemical components. A reaction in your brain causes you to speak, triggering a reaction in my brain, causing me to speak. It's a chain of cause and effect stretching all the way back to the Big Bang. All of these things are utterly predictable, if you understand the system perfectly. You can predict the paths of the electrons in your brain, the patterns of vibration in the air. The universe is a chaotic system, a very complex one, but it is also a deterministic one. Choice is just an illusion.

ANNA

Lamb next. I don't buy that. I can feel myself choosing to talk.

Nathan brings a lamb burger across.

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NATHAN

You can feel yourself touching those burgers, too, but actually nothing in your hand ever makes contact with it. There's a lot of empty space in between. There is a huge gap between reality and human perception. The universe doesn't conform to our expectations. And it sure as hell doesn't bend to accommodate us. It doesn't act the way we want just because that's how it feels like it should. The universe isn't fair.

ANNA

Ah. Now we're getting to the bottom of it. Can I get a chicken patty across, please? So you're having a rough time, and suddenly your life is outside your control? Everything is being guided by this malevolent, invisible hand?

Nathan checks on the chicken by tearing it with his tongs.

NATHAN

Chicken's still a bit pink, give it a few seconds. You're missing the point. It's not conscious. There's no guiding spirit. No-one is directing it. It's just the workings of this big, indifferent machine.

ANNA

That's very pessimistic. I don't think you're seeing the whole picture. We still don't understand exactly how the brain works. I'm not sure that reality is this big puzzle that can be solved for every last variable.

NATHAN

I am.

**13. INT. NATHAN'S ROOM. NIGHT**

Nathan returns to his room from work. He is exhausted, collapsing into his desk chair, but opens his physics notepad and tries to continue work on his assignment. He rests his head, turned to the side, on the desk while he works. Midway through writing an equation, he nods off.

**14. INT. NATHAN'S ROOM. MORNING**

Once again, we see the pool game from before. Bright lines trace the paths of the pool balls, as they move in exactly the same way as before. There is a rising drone in the background.

The alarm wakes Nathan again. A couple of days have passed. He has become visibly more shabby, unshaven. Groaning, he snoozes his alarm and falls almost instantly back to sleep.

Cut to his alarm repeating ten minutes later. Nathan rises regretfully. He contemplates his contact lens case, but instead puts on the pair of glasses lying next to it. He sprays deodorant on himself, pulls a pair of jeans on over his boxers, and leaves for class.

**15. INT. LECTURE THEATRE. DAY**

Nathan sits in the lecture theatre. His eyes are closed, and he is holding his head in his hands.

LECTURER

Lately, we've only been looking at a classical interpretation of the laws of physics. But as we delve deeper, we're going to realise that those laws are incomplete. Quantum mechanics are needed to describe the universe's behaviour on a small scale, and believe me, from there it gets weird. First of all, let me introduce to this: The Uncertainty Principle.

Nathan opens his eyes as the lecturer draws an equation on the whiteboard:  $px = h/2$

LECTURER

Although it might not make sense just yet, what this equation indicates is that reality is not inherently predictable. There is no way of knowing all of the information about a system. For

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LECTURER (cont'd)

example, the more you know about a particle's momentum, the less you can know about its position and vice versa. These aren't just limits in our technology or our understanding; they are fundamental limits, in the way the universe is made. As we probe further, we'll learn about the Born Interpretation and other principles which introduce further uncertainties. The main message is: The universe has a great deal of randomness to it, in a very fundamental way. It can be predicted on a statistical level, but not on the level of quanta, or, indeed...

NATHAN (V/O)

Individual human beings.

Nathan sits up. In his mind's eye, we see the Earth floating in space, the Moon in orbit around it; the view zooms out so that we can see the Sun and all of the planets orbiting it; then in turn the frame zooms to a view of the entire Milky Way galaxy, then even further, so that many galaxies are in view, and then so that they are only specks of light in a grand picture of the universe.

NATHAN (V/O)

That means... maybe the world isn't deterministic at all.

**16. INT. NATHAN'S ROOM. MORNING**

Nathan wakes up to the sound of his alarm, one more time.

**17. INT. BATHROOM. MORNING**

We see Nathan in the process of shaving, from his perspective. His view is sharp and he is not wearing glasses, indicating that he has already placed his contact lenses.

**18. INT. NATHAN'S ROOM. MORNING**

Nathan returns to his room, fully-dressed, and opens his Physics assignment. He finishes the last question, circles the answer, and staples the pages together.

**18. EXT. UNIVERSITY. MORNING**

Nathan walks through the university. It is raining, but Nathan is smiling, enjoying the feel of the water on his skin. He reaches the assignment box, opens his bag to retrieve his completed work, and drops it in.

**19. INT. RESTAURANT. NIGHT**

Once again, Nathan is at work. This time he is on the floor, clearing tables. As he brings the plates to the sink, he takes a moment to talk to Anna, who is washing and stacking dishes in the dishwasher. He leans on the running dishwasher.

NATHAN

I was wrong. Choice isn't an illusion. Or, maybe it isn't. The universe might not be deterministic, you see.

ANNA

Yeah?

NATHAN

There's an element of randomness to every action and reaction. You can't predict when a uranium atom will decay no matter how much you know about it. And you can't understand a system perfectly. It isn't physically possible. The more you know, the less you can know. So maybe... maybe there's room, in all that uncertainty, for choice. For free will. Maybe we shape that randomness, to a degree.

ANNA

You've changed your tune. So the universe does look after us, after all?

NATHAN

No, no. That's not what I'm saying. If that were true, humanity would be the centre, and that's it. Nothing else to see here. And that would be awful. There's more to the universe than our petty problems, here on the ground. There's so much more potential out there, in that empty space.

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ANNA

So you're taking it all back?

NATHAN

I take back everything I've ever said. From birth, if possible.

ANNA

Nay, from conception.

NATHAN

I wasn't very talkative as a zygote.

ANNA(LAUGHING)

Well, we don't know that.

NATHAN

No, I remember very clearly. Embedding in my mother's uterus. Making more stem cells.

Anna laughs.

NATHAN

Differentiating. That was a fun day.

ANNA

(Laughing) Shut up!

NATHAN

Being an embryo was a tough period, but I got through it.

UNNAMED MANAGER


(Shouting) Anna! Can you wrap?

ANNA

I'm no Jay-Z, but...

UNNAMED MANAGER

Hah, very good. Get on with it.

Nathan is leaving for the night, wearing a  jumper over his work uniform. He glances at the pool table as he leaves, which is again about to be broken. This time, the balls follow completely different paths; none of them are sunk, although the green 6 ball bounces very close to a pocket. Nathan nods quietly to himself as he walks.

**10. EXT. PARK. NIGHT**

We return to a shot of the night sky, with the same stars as before. The sky is a lighter shade, a friendlier deep blue.

NATHAN (V/O)

The stars aren't lonely. They don't feel anything. They're emotionless balls of nuclear reaction. But we feel. And we're the ones filling in the gaps.

The film closes with a shot of Nathan's face, breaking into a smile.

