

## #TECHNOLOGY

### Now comes Water-Based Batteries

"There would be no battery fires anymore because it's water-based," Lutkenhaus says.



Researchers have discovered a 1,000% difference in the storage capacity of metal-free, water-based battery electrodes. These batteries differ from lithium-ion batteries that contain cobalt. The group's goal of researching metal-free batteries stems from having better control over the domestic supply chain since cobalt and lithium are outsourced. This safer chemistry would also prevent battery fires.

Chemical Engineering professor, Jodie Lutkenhaus, and Chemistry assistant professor, Daniel Tabor, both of Texas A&M University, report their findings about lithium-free batteries in *Nature Materials*. "There would be no battery fires anymore because it's water-based," Lutkenhaus says. "In the future, if material shortages are projected, the price of lithium-ion batteries will go way up. If we have this alternative battery, we can turn to this chemistry where the supply is much more stable because we can manufacture them here in the United States and materials to make them are here."

Lutkenhaus says that aqueous batteries consist of a cathode, electrolyte, and an anode. The cathodes and anodes are polymers that can store energy, and the electrolyte is water mixed with organic salts. The electrolyte is key to ion conduction and energy storage through its interactions with the electrode.

"If an electrode swells too much during cycling, then, it can't conduct electrons very well, and you lose all the performance," she says. "I believe that there is a 1,000% difference in energy storage capacity, depending on the electrolyte choice because of swelling effects."

According to their article, redox-active, non-conjugated radical polymers (electrodes) are promising candidates for metal-free aqueous batteries because of the polymers' high discharge voltage and fast redox kinetics. The reaction is complex and difficult to resolve because of the simultaneous transfer of electrons,

# 'Tarak Mehta Ka Ulta Chashma,' 'Bala,' 'Bhediya' And Now 'Stree 2'

PART:1

*Stree 2's* journey to the 500 crore club has caught the nation by storm. So, we, at Rashtrdoot, decided to get you a trilogy of exclusive interviews with the makers of this blockbuster!



Shailaza Singh  
Published Author,  
Poet and a YouTuber

Though, he has a master's degree in engineering followed by MBA, Niren Bhatt's life has always been about writing. He has written plays in his school, and in college, and now, he writes for a living. The stupendous success of *Stree 2* has made him the cynosure of all eyes. Some excerpts from a recent interview are here.

#### How did you get into writing?

I grew up in a small city called Bhavnagar in Gujarat, where only 1 or 2% of people speak Hindi, apart from that, every one speaks Gujarati. But my mother was a professor of sociology and she used to take me to her college. There, she introduced me to the library. She used to take me to youth festivals and that was my first introduction to theatre. I found it so fascinating that I started doing and writing plays in my school. I wrote a lot of plays in my college too, and some of them even won state and national awards. I was a good student and I continued doing theatre and even wrote songs. Most of my plays were very popular because they were musicals.

#### But if you were so inclined towards writing, why didn't you choose it as a career in the initial days?

(Laughs). I was good in my studies so it was natural that I would do



Niren Bhatt with Varun Dhawan.

masters in my engineering and then MBA. These days, there is a joke going around in the industry that with double masters in engineering and management, I am the most educated writer here! So, once I completed my engineering, I worked in a corporate setup for like around four years. I was a business consultant at a cushy corporate job with a big fat salary.

#### When did you realize that writing was your first and only love?

After some years in the corporate world, I realized that this life doesn't belong to me and I don't belong to this world. I am a creative person and I need to find my own thing. So, that's when I started writing alongside my corporate career. Managing two things at the same time was very hectic but I started writing plays, films, songs and whatever came my way. It was in 2011 that I finally left my job and became a full-time writer.

#### Didn't your family object?

Initially, my parents didn't know. I didn't tell them. My wife knew and she, being an artist, supported me wholeheartedly. It was when I started writing for *Tarak Mehta Ka Oolta Chashma* and it became the most popular show in my country that I told my parents about my writing and that I had left my job. For my mother, it was a matter of pride and she also supported me in my decision. Somehow, my life, in a way, is built by very strong females. My mother, and my wife, have always supported me and motivated me, and somewhere, I think it reflects in my writing also.

#### What inspires you to write the horror genre, especially the horror comedy?

I have always been writing comedy from the very beginning.

## #STREE STRIKES



Kiriti Sanon, Niren Bhatt and Varun Dhawan.

Whether it was serials like *Tarak Mehta Ka Oolta Chashma* or movies like *Bala* or *Bhediya*, comedy has been predominant in my work.

I always had a fascination with horror because I'm a very voracious reader. I read a lot whether it is Hindi literature or Urdu literature or Gujarati literature or English literature. So, I was a big fan of authors like Neil Gaiman and Stephen King. Peter Straub and I have devoured almost all their books. I actually started my writing career in television with a horror show. It was called *Yeh Kaali Kaali Raata*, which was produced by Rajiv Mehra, who later made films like *Chamatkarr* (starring Shahrukh Khan, Naseeruddin Shah) and serials like *Office Office* (starring Pankaj Kapur).

#### Could full-time writing support you financially, initially?

In the initial days of switching my career from the corporate world to full-time writing, I was very speculative whether I'll be able to survive or make enough money from writing or not. But I took a plunge and in a couple of years, I think things fell in place, and I started writing episodes for *Tarak Mehta Ka Oolta Chashma*. Now, by that time, I had written story and lyrics for a Gujarati film. It was called *Bay Yaar*, which became a very big hit. From there, my Gujarati film career also took off. So, parallelly, I was writing television, Gujarati films, songs, and Hindi films. Some of them worked, some of them didn't. I also worked for OTT, which made me confident that my writing would be able to support me.

#### How did *Stree 2* happen?

The first movie *Stree* was based on a folk legend called *Naleba*.

*Naleba* is a legend of Karnataka. For many years in the past, people used to write *Nale Ba*, which means 'come tomorrow on their doors' because they believed that evil spirits roamed around in the night, and could be distracted by writing 'Nale Ba.' So, the first story was written by Raj and DK. I loved the first part and the crazy energies of all these actors. Amar Kaushik, the director, roped me in for the second part. By that time, we had already done movies like *Bala*, *Bhediya* and a couple of other films that Amar was directing. So, we already had a four-year-long association. The final script of the movie happened only after rigorous writing for around two-and-a-half years, and about 15 to 17 drafts later.

#### How did the drafts change in those years?

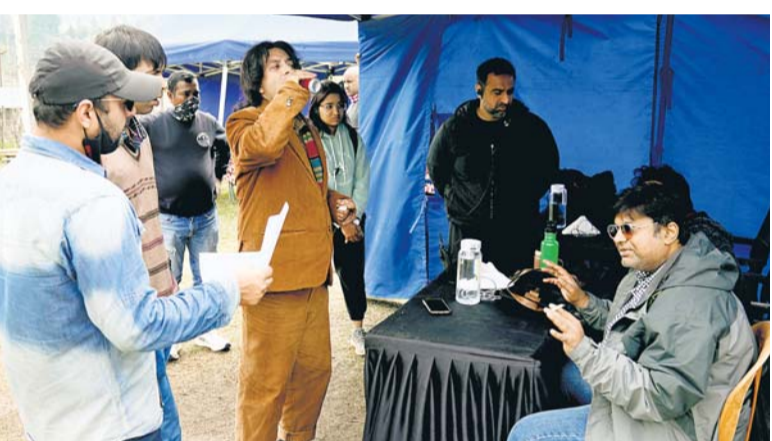
We had two completely different versions of it. When we started working on *Bhediya*, we discovered what all we could do with VFX. So, for *Stree 2*, we wrote a completely new version and then it also went through, like, numerous drafts. Because, see, in this kind of film, you need to write a lot because it's also about the dialogue. It is not just about the progression of the story. For example, we showed *Shama*, the girlfriend of Pankaj Tripathi, who was mentioned in the first part. For a movie to become an enjoyable experience for the viewer and the creators, one has to do a lot of brainstorming. Characters are created, discarded, written about, and sometimes included, but in the end, it has to satisfy the needs of the narrative and the story.

#### Who are involved in this kind of brainstorming?

It is generally between Amar Kaushik and me. I throw up an idea, he throws two ideas back at



Niren Bhatt with Amar Kaushik and other members on the set of *Stree 2*.



Niren Bhatt with Amar Kaushik.

me, then we decide, out of all these three ideas, what we want to do and then, I write down dialogues and everything, and then, we take a call whether it's working or not. If I have some concerns, I raise them to him and tell him that 'see, I think, this scene is good, but it can be better with dialogue, but it has this kind of a flaw.' So, if he has a fix to it, then, he says that we can fix it in this way, but these dialogues are working. So, this is how we have worked. Though it is a hard process to follow, I think it has worked for us.

#### How does writing for a web series differ from writing for a movie?

Writing for a web series, in a way, is very fulfilling for a writer because the film has only about 120 to 140 minutes of the story. It is like fitting an elephant into a matchbox! And I love all my characters in whatever movies or series I have written. So, I would like to go into all their stories. I would like to explore all their equations, but films are more or less about the hero's journey and it has a plot that follows one person's journey mainly.

And that's why the scope of exploration of all other stories is less in films. Hence, writing for OTT is a dream for a writer, but it's a very hard process because again, it's like, like I said, it's 120, 140 pages in films, but in OTT, it is 500 pages of script. It's like writing a novel. Okay. There are like six to eight episodes, each episode is supposed to be like a film, it is supposed to have a beginning, middle, and an end. It is also supposed to have a cliffhanger, which will, make people watch the next episode and binge-watch the whole show. And it is also supposed to have a story of a full season. On top of it, it is also supposed to have a broader story, which will span across two or three seasons. Yes, it gives you a lot of opportunities as a writer, but it's a

whole night. But now, I avoid writing nights because it is not a very healthy schedule to follow. When I was writing for television, I wrote a lot of nights.

#### Do you write longhand or on the computer?

I'm a techie. I write using my computer. And so, I have a desk which is a standing cum sitting desk. I have a mechanical keyboard. I adjust the laptop at different levels so that my neck and fingers don't get hurt. I've had all sorts of health issues related to writing, sometimes finger pains, sometimes shoulder pain, and sometimes neck pains. And all those are recurring physical issues associated with writers. Then, I consulted doctors and they advised me to spend money on ergonomic equipment, ergonomic stands, ergonomic chairs, ergonomic tables, mouse, a keyboard so that I can work for long hours without harming my body.

#### Have you ever been spooked?

I never get spooked. I am a person of science. And now if you ask me, personally, I don't believe in ghosts. I like the idea of it. Because somewhere, ghosts are metaphors. For example, *Sarkata* is basically a metaphor for patriarchy. Pankaj Tripathi says also that he is *Chanderi ka Pitru* who has come back to establish his power. So, *pitru* is basically patriarchy. I mean, ghosts, for me, represent different aspects of humans.

#### How much of your writing is modified on the set?

A lot of it. Okay, because we have a process, me and Amar that always have to be on sets of all my films. And it sit next to him. And we both are looking at the scene and we are talking constantly whether it's better than what we have written or fits not coming out as we expected. Who is doing what, which is like taking the scene in that direction? So, what can be funnier in this? Of course, our actors are champions. So, Rajkummar Rao, Abhishek Banerjee, and Pankaj Tripathi add lots of things when they are performing in the scene. A lot of improvisations happen on set. After the shooting for the day is over, I rewrite the next day's scenes again, and I think the best one-liners and the best dialogues have come from there.

#### What advice would you give to someone who is new in the industry or wants to make a career in the industry?

I always have the same advice for me as well as anyone who wants to make it big in the field of writing. It is a hard thing to do but the foremost thing to do is to cultivate discipline in your writing. The second thing is to read a lot because the more you read, the better you will get in writing.

...To be continued



Niren Bhatt with Amar Kaushik.

## #MEMORY

### Ways To Boost Your Recall

We are primarily visual creatures who best remember images, rather than words.



Methods for strengthening memory can be traced back hundreds, if not thousands of years. The key insight was learning to think in pictures, rather than words. And when you think of it, this makes sense. We are primarily visual creatures who best remember images, rather than words. The real challenge for our memory (and intelligence) is to correlate things that aren't ordinarily thought of, together. Here are a few key tips to practice for retention and recall of memory.

#### Use All Of Your Senses

Picture yourself drinking coffee. Not only can you imagine yourself doing that, but you can also imagine smelling its delightful aroma. In your imagination, you can taste it and savour it as it flows over your taste buds. The coffee experience is both verbal (naming and describing it) as well as sensory (tasting, smelling, etc). Nouns like 'chair' and 'notebook' can be described and imagined in different ways (the comfort of the chair, the softness or hardness of the notebook and so on). The more senses that can be recruited, the more likely you will be able to form a long-lasting memory, as more areas of the brain are involved.

#### Create Meaningful Stories

Our brains are designed to work with meaning. If meaning isn't obvious, we create it. The easiest way to organise unrelated information is to place things that you are trying to remember, into a framework like a story or a rhyme.

#### Your Own Memory Theatre

It was the 16th-century architect and philosopher, Giulio Camillo, who suggested the memory theatre as a way of using images and loci (the position of these images) to remember. The *loci* method remains one of the most popular, used by mnemonists. Come up with a longer list of your own loci and place a list of random items in them. The more bizarre or irreverent the images you come up with, the easier they will be to remember.

#### Use Association

Simply thinking about how two or more things can be associated requires you to concentrate on larger, attend, two brain activities, which, on their own, lead to enhanced memory roundings.



#### Look Inwards

One step beyond are situational exercises directed inwards. Situational exercises involving self-exploration are used in creative-writing seminars. After encountering unfamiliar people in a social setting, the aspiring novelist is asked to incorporate them into the plot of a novel or short story. As an exercise for remembering an unfamiliar group of people, you can invent a visually vivid story around them. A similar method of looking inwards is used in the training of psychoanalysts. It is referred to as 'self-analysis.'



#### Try 'Chunking' To Remember Numbers

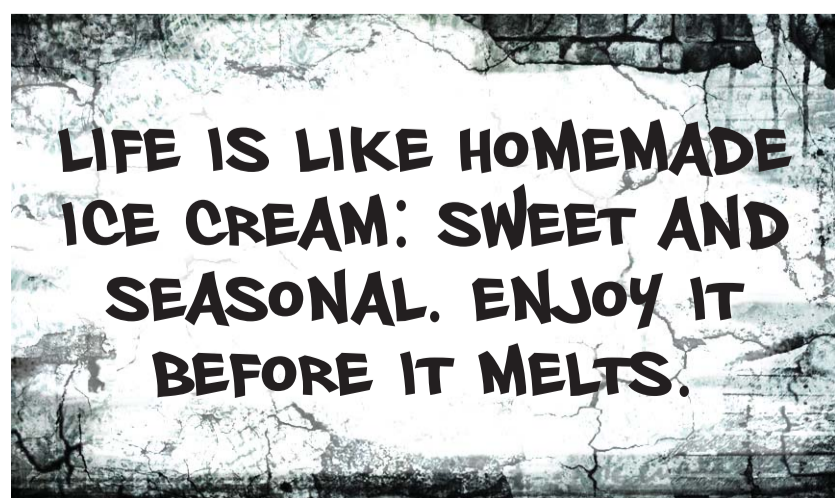
Look at this long string of digits for one minute. 349370327222500454680208713456 5537006761921852344568075614503594 92340096067659087 Now, turn away and write down as many as you can remember, starting from the left. How many were you able to come up with? According to the Montreal Cognitive Assessment (MoCA), the gold standard among neuropsychological screening tests, your performance was acceptable if you remembered five or more. But what is the upper limit of numbers that can be remembered by a group of people randomly chosen? Take another look at the digits you attempted, to memorise and arrange them like this. 349-370-5272 227-500-4546 802-087-1345 655-370-0678 192-165-2344 568-075-6145 055-948-2340 096-067-6590-87

#### Think Like A Navy Seal

To get a feel for this, the next time you are in a restaurant, close your eyes for a few seconds and mentally picture the arrangement of the people sitting around you at the nearby tables. If you are like most people, you probably won't do very well with this memory exercise, the first time you try it. The goal is to employ your attentional focus in the manner of a searchlight scanning the night sky. The more you practise, the greater the breadth and depth of your memory. You will remember more because at a given moment, your memory is encompassing larger swaths of your immediate surroundings.



## THE WALL



## BABY BLUES



## ZITS

