Interview with Kenneth Chang | Module 2

[00:00:12] **John O'Neil** Welcome back, everybody, and welcome to Ken Chang. Ken is a science reporter for The New York Times, and he's been doing it since 2000. And I got to know him there when he wrote a few things for science and he wrote more things for me when I was a special section editor, probably other things I can't remember. Ken covers a lot of different kinds of science. He covers chemistry, geology, solid state physics, nanotechnology, Pluto and other bits of science. And it's been, we're recording this on December 16th and it's been a busy week for Ken who thought he had a busy weekend just dealing with the splashdown of the Orion spacecraft. And then there was News and Fusion. And we're going to we're going to talk about that. So what happened this week in infusion, nuclear fusion?

[00:01:11] **Ken Chang** So these researchers at Lawrence Livermore, they sort of hit this milestone occasion, which is where they actually got more energy out of fusion reaction than energy they put in to start the reaction. So that's what they call ignition. And that's something that they've been trying to do for literally 50 years. And we finally crossed this threshold.

[00:01:30] **John O'Neil** How it was. It was big news and it was nuclear fusion is complicated. And I read a variety of stories that ... Some of them didn't even mention how it was done, and and your piece said, let me call your piece and share my screen. So here is Ken's story from a few days ago. Science Achieve Nuclear Fusion breakthrough with a blast of 192 lasers.

[00:02:08] So just looking for a walk through just the structure of the story is that you you say what happens? I say why this matters, that they've been trying to do this for a long time and could be a great source of energy. And in particular, why this matters is that we've just had that landmark you just talked about what they call ignition, producing more energy than it took in. I scroll down to we always have to have quotes like story I can put, and here's some more about the significance of it. So here we get to what is fusion? Fusion is what the sun and the stars do. And what we've been trying to do is replicate that. And what has happened, it's changed us. We were able to to create more energy than it was consuming. So here we go to the description of what happened to your readers, these next couple paragraphs for us.

[00:03:20] **Ken Chang** Sure. That changed at 1:03 a.m. on December 5th, when 192 giant lasers at the laboratory's National Ignition Facility blast a small cylinder about the size of a pencil razor that contained a frozen nubbin of hydrogen encased in diamond. The laser beams entered at the top and bottom, just longer vaporizing it. That generated inward onslaught of X-rays that compressed the BB-size fuel pellet of deuterium and tritium, the heavier forms of hydrogen. In a brief moment, lasting less than 100 trillionth of a second 2.05 mega joules of energy, roughly equivalent to a pound of TNT, bombarded the hydrogen pellet. Out flowed a flood of neutron particles -- the product fusion -- which carried about three mega joules of energy, a factor of 1.5 in energy gain.

[00:04:12] **John O'Neil** So this is let me just mention a couple of things I like about this description is it's very specific and it's visual. I mean, you get some some great comparisons here. It's the size of a pencil eraser or a racer, and it's frozen and it's in diamonds. This makes it much more vivid. And then you walk through the process in a way that's cool to me, which was very clear. But also as somebody who's tried to write stuff like

this, it's remarkably concise. So how were you able to do something that was so vivid, detailed, clear and concise for a news story?

[00:05:02] **Ken Chang** So I guess this is the part where you talk about the virtues of self plagiarism. So I have covered ...

[00:05:08] **John O'Neil** Self plagiarism. Explain what you mean by that.

[00:05:13] **Ken Chang** So I've covered this two previous times, those early announcements in 2014 and 2021 last year where they had made incremental advances toward this achievement. And I'd actually in 2014, I think I've now to Lawrence Livermore visit this laboratory saw these cylinders and had people explain it to me this in detail. And last year they had this achievement where they hadn't reached ignition but they had gotten 70% of the way there. And so that story I wrote something very similar. In fact, I think what I did was basically copy the same relatively same description from the story last year, pasted in the stories and just updated some of the details like the time. And and so that was a way because I didn't need to reinvent the wheel and come up with a new description when I already had one that was that worked pretty well.

[00:06:13] **John O'Neil** I think this is a really important point because, you know, sometimes in newsrooms, people say, oh, we can't do that, we've already done it. If you think of the reader, so the reader does not remember what you wrote in 2014 and probably doesn't remember what you wrote in 2021. So the standard should be what's the best way to bring a clear explanation to the reader if you've already done one? You're ahead of the game.

[00:06:43] Some colleagues of mine sometimes say the fastest way to do something is to have already done it. And unlike new stories, the parts of new stories that are different. Each time there are some things that are similar with your writing about Congress and explaining what the filibuster is, or writing about science and writing what fusion is that, you know, borrowing from yourself is always a useful source of information.

[00:07:15] Sometimes we, the quicktake explainer page team I'm on, when we are feeling as anything that Bloomberg News has done. Because there are a lot of stories where you find there are little bits and pieces of explanation scattered around the news stories or so should they. And you can look at those and think, okay, I can use that. Whether it's directly or combining with lots of things or mushing together. So was there anything that you needed to learn for this one that you needed to figure out how to do on deadline? Or is this more of like adding a news to the already existing knowledge?

[00:08:01] **Ken Chang** So I knew how the experiment worked. I knew that 192 lasers. I knew that it was deuterium, tritium that was in the fuel. So because I knew that background, I could focus when I talked to them, like the specifics, how much energy that they get out, what improvements have they made since last year that got them from 70% to 150%?

[00:08:23] **John O'Neil** And so I find that stuff here. As the 70%. They performed a series of experiments to better understand that success and what they did to pump things up and improve things. Mm hmm. So? So because you have the basic understanding, I would say basic as a shorthand. You understood a lot about this before you were able to focus on what's the new thing that needs to be explained here.

[00:08:59] **Ken Chang** Right.

[00:09:00] **John O'Neil** Squeezing the pellet evenly. So it doesn't squirt out the side. I hate it when that happens.

[00:09:08] **Ken Chang** You know, it always messes up your future.

[00:09:12] **John O'Neil** So what might be an example? So this is an example of something where you're able to use self plagiarism because you've written about something before, you've done the research and done the interviews to understand it well. What's an example of something in science where you have to explain something that you weren't so well prepared for. It's more of a kind of deadline scramble.

[00:09:40] **Ken Chang** Yeah. The quintessential example is the Nobel Prizes. They don't tell anyone, including the recipients, before that morning. And so and typically, I have done the chemistry, which is sort of the most esoteric science one. So I'm waking up at 5:30 am, 6 am. I log on and all sudden something pops up and I'm just going, what the heck? So if I would bring up example, this is memorable from 2004 again.

[00:10:13] **John O'Neil** I'll stop sharing if you want to share.

[00:10:17] **Ken Chang** Well, I'm just going to read it. I. Okay. But. So this is why I saw on the Nobel Prize so that these three scientists got the Nobel chemistry Nobel for, quote, for their discovery of ubiquitin mediated protein, protein degradation. And I'm just like, I don't know.

[00:10:35] **John O'Neil** So let me just say first, is that the reason this is a challenge is that the story is not just. You know, Tom or Sally got the Nobel Prize and that they got it for. Fill in the blank. You want to be able to tell people what that was and what they figured out that was important. So you go from can you repeat that a little more slowly what that phrase was.

[00:11:04] **Ken Chang** For the discovery of ubiquitin mediated protein degradation.

[00:11:09] **John O'Neil** All right. And these.

[00:11:13] **Ken Chang** You know.

[00:11:14] **John O'Neil** Story handy is, too. What are you describing? Or you just remember?

[00:11:21] **Ken Chang** I don't have a handy in front of me, but I just remember I recognized it was for the discovery. I have no idea what ubiquitin is. I know where protein is and degradation. You sort of have some idea, but. Beyond that, I mean, you're trying to write two or three paragraphs and basically for the first or first take at that. And that's basically you can quote that. And the Nobel Prize Committee, they put out pretty good press release and then they actually include a lot of scientific backing, including one that's written more for a lay public. But you're still just reading through it and sort of scrambling.

[00:12:05] **John O'Neil** So so the first take is you say what it says. Maybe you grab a quote from the prepared material, but then when you come back to it, what do you what do you do? How do you try to understand it and then explain that?

[00:12:19] **Ken Chang** So I'm fortunate to have a friend who is a microbiologist and she writes. She's written or is one of the authors of this big biology textbook. I emailed her like, What the heck is ubiquitin? And and she explained to me, it's actually kind of cool. It's this big chamber within cells where, you know, proteins are the main functioning component within cells to pass messages, go structures, and no one state serves their purpose. The body has to get rid of them and we use the building blocks to amino acids. So basically there is another molecule that takes this protein that's outlived its usefulness, drags in into this chamber and it gets chopped up again and then recycled. And then once I've got that, it's like, oh, this is kind of cool, and I can explain that.

[00:13:16] **John O'Neil** Okay.

[00:13:17] **Ken Chang** And then and once, you know, then you can find the people who have done similar research, know get them to get quotes. And by the end of the day, there's this nice long thousand word article that makes me look like I knew that stuff all along.

[00:13:33] **John O'Neil** Okay. So, so some of this comes out of because you've done reporting within a field, you build up the source network and you find someone who can be a little bit of a guide or a translator, and then they give you the they give you clues that you can then go pursue and then find other people who are doing similar things. So, you know, you're sort of the equivalent of your cop shop reporter and there's a murder. There's one detective who tells you something that leads you to them, you know, who else to go to.

[00:14:11] **John O'Neil** So in some ways, the research project to be not everybody taking this class as there's only a science reporter, but we can can apply some of these. You know, you're you research it out. You report it out like you would any other story starting from whatever you can grab hold of and then finding more people to call. Call ten people and get three phone calls back. And thanks to the Internet we can take a little bit of explanation and add to it and add to it and add to it. But do you ever and this can be true, whether it's breaking news or not, breaking news, do you ever either come across something that people are trying to explain it to you and you feel like you don't understand it well enough to explain or they've explained it to you, but you don't know how to explain it in a way that you will ... A question I meant to ask earlier is, what's your idea of your audience and where does that idea come from about what level of complexity you can get into?

[00:15:21] **Ken Chang** My sense is I'm writing for someone who's curious about this topic but doesn't have a particular background in it. I'm assuming that I can follow a logical explanation and but they don't necessarily know what a proton is or amino acid. But they're curious enough that if I can explain in a way that, you know, makes sense and takes them along and doesn't feel like I'm talking down to them that they'll enjoy it and feel like they've gotten something out of story when they finished it.

[00:15:53] **John O'Neil** That's that's really interesting thinking in terms of that, in terms of the readers motivation, because that gives you a hope to try and build on that. And you know, why this sort of visual writing that we saw in the fusion piece is really important because like, I'm not just going to throw a bunch of ten syllable words at you. I'm going to give you, I'm going to let you build a picture in your mind as you read along with us, because I'm assuming you're reading this because you care about it. So what happens when you, like, feel like you can't quite get there?

[00:16:34] **Ken Chang** Well, usually I try to keep on asking questions and talk. Either it makes sense to me or the science is so frustrating that I can't get any farther. Okay, so here's an example from quite a while back, and I forget that you did this special section about the anniversary of flight. So there was a story that I did about why does it play in acute cute to not fall out of the sky?

[00:17:05] **John O'Neil** Good thing to know.

[00:17:07] **Ken Chang** And so you see a you know, that is a curved wing cross-section. So the top part of the wing is more curved than the bottom part. And there's usually this really complicated, really physically stunning explanation call involving the Bernoulli principle, which is true, but it doesn't really help you. What really helped is that one of the aeronautical people told me that it's basically Newton's laws of physics, that the wing preaches air down and by the third law of Newton, every reaction has an equal and opposite reaction. So if you push the air down, the wing pushes the airplane up. So that was that was good. And then then I ask another question like, oh, that just means that there's bouncing off the bombed wing. And they said, no, actually what happens is that it's the top of the wing that sort of pulls the air down. And and and so that way I asked enough questions like something that wasn't wrong, but actually got an explanation that that was explainable instead of having to say the pressure differential of the top wing, the bi-wing results in the net force going upward. And so that's my example of how you want to keep on asking questions so that it makes sense in your mind and you ask of the next obvious and supersonic question. But the answer that actually keeps you from saying something that's completely wrong.

[00:18:43] **John O'Neil** And for the great virtue of asking dumb questions, right, no such thing as a dumb question. And it's we're representing people who don't know what we're trying to tell them, the reader. And we often don't know it until someone tells us. So we have to approach this with a certain humility. And that will allow us that there's a term we're going to discuss more later in the course called hand-waving, where I think I see more about science in science journalism elsewhere of it when you sort of like ... It happens because it happens and you find some some way to sing makes it sound not quite so hand-waving. You know, I've done it on occasion. I think we all get to that point sometimes, but the way to avoid it is just like. Can you tell me that again? So what do you what are you going to ask people questions about next?

[00:19:54] **Ken Chang** So I'm not sure what my next really deep science story is. I have some things about NSF grants, but that's sort of interesting subconscious bias perhaps about how different racial groups are less successful than others and getting NSF grants. So it's actually more psychology than the actual physics I usually write about.

[00:20:18] **John O'Neil** Hmm. Okay. Well, then you'll be approaching it without having written the last 12 years of stories about it, and you'll get to ask more dumb questions.

[00:20:30] **Ken Chang** Yes, I enjoy asking dumb questions. It's the best part of this job.

[00:20:36] **John O'Neil** So listen, Ken, thank you very much for your time and it's good to see you again. And we look forward to reading about those, the smart answers to the dumb questions.

[00:20:47] **Ken Chang** Thank you very much.

[00:20:48] **John O'Neil** Okay. Thanks.