

The Hibernial Teletherm: A Stochastic Celebration

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Burlington, Vermont

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Welcome all to the Stochastic Celebration of the Winter
Teletherm

So what are we doing here?

First, a definition: The Summer and Winter Teletherms are the dates of the on-average highest and lowest temperatures. Confession: We made it all up. Teletherm = distant + heat. Which is modeled after solstice = sun + stop. Let’s start with time. We’ve had a handle on the solstices for many thousands of years. Stonehenge is famous of course—that whole stacking a heavy stone on two other heavy stones was good work. But well done to Ireland with [Newgrange](#): A neolithic stone monument which is 5,200 years old—older than Stonehenge and the Pyramids—that is lined up for the sun to shine through a passageway into the center during the winter solstice.

Measuring time wasn’t easy but we got there, and well before we realized we could measure temperature accurately, or even at all. So, we started thinking about Teletherms back in 2008 or 2009. I’m not sure if it was exactly the spark, but I

remember a relative of Aimee's declaring that today was the winter solstice, and it was the coldest day of the year. In my brain, I was like: "Mmmmmm, noooo." So I made some plots for Burlington and Central Park and then the project sat there for a while. Eventually, we scaled up and analyzed temperature patterns from 1850s on at over 1200 weather stations which are pretty evenly distributed across the US. You'll be delighted to know that we finally put out a paper in 2015: "Tracking the Teletherms: The spatiotemporal dynamics of the hottest and coldest days of the year."

For any place, we measure Teletherms by averaging minimums and maximums for each day of the year over different time scales: 10, 25, 50 years. And yes, we do handle the every-four-years leap day, I know that's calenderically thrilling. The 25-year winter teletherm for Burlington turns out to be wrapped around Groundhog's Day—which is today. The on-average coldest day is January 27. The Teletherm period for Burlington (and it's measured at the airport)—when the average temperature is within 2% of the annual dynamic range of temperature for a place. The period currently runs from around the middle of January to the middle of February with the first week of February a little warmer—there's a statistically measurable thaw. Of course, in any given year, January 27 might be warm and this celebration will seem silly. This morning was solidly cold so—a low of -6F—this year feels okay. But we are embracing randomness. And: Climate versus weather. Burlington's Summer Teletherm is also spread out and runs from around July 10 to August 10 with the maximum at the start of August. Both the winter and summer teletherms are well after the solstices.

Over time, Teletherms can switch, snapping from one date to another, which could be many weeks apart. We've found many places that have two or three isolated on-average coldest and warmest periods. For dynamical systems fans, these are imprints of bifurcations and trifurcations. Teletherm behavior is a fine-grained measure of climate change. In the US, the middle of the 1900s was relatively cold—scientists were talking about melting the ice caps and that has been something for

disinformationists to crow about—but even that trend was not uniform across the US. Uh-oh, I just heard the sound of all of our funding disappearing. Oh well.

The earliest teletherms are only a day or two before the solstices. The most interesting ones come well after. Chatham in Michigan has the latest Winter Teletherm: February 15.¹ Willow in North Dakota has the coldest one: -8F on January 15. Unsurprisingly, Death Valley has the hottest Teletherm, on July 28: 120F. I remember a person who lived there saying there's a big difference between 117F and 118F. Existing becomes decidedly less fun. And right along the west coast, things are very different. Santa Cruz's Summer Teletherm is September 4, much closer to the fall equinox than the summer solstice.

And because Groundhog's Day also acknowledges randomness—and also led to the greatest of all existentialist works—we might as well have a fusion stochastic celebration. This year it's 6 more weeks of winter by the way. The Teletherm might be confusing but so is Groundhog's day apparently. Here are [some teenager texts referring to Groundhog's Day per the Leighton Show on Instagram](#):

- “It’s warm out—I guess the otter was right.”
- “Why is it so cold? I thought the beaver said spring was here”
- “How accurate is the groundhog?”
- “Did the warthog see its shadow?”
- “The hedgehog said spring was coming.”
- “When is gopher’s day?”

We’d really like to see the Stochastic Celebration of the Teletherms spread. We used to hold Teletherm parties but

¹These teletherms are based on the 25 years from 1988 to 2012.

things happened and we're trying again. Food is central to any good festival, and we've gone for a blend of quite hot and quite cold, which could work for winter and summer. What we haven't done so far is dreamt up an anthropomorphic personification. It's always about the storytelling, and we need good characters. We need the Teletherm's version of Santa Claus or the Grim Reaper, or the Hogfather or Death. And also for the licensing and merchandising.

So I asked ChatGPT—both for fun and as an act of pure capitulation to the madness of where we are now: “What do you suggest for an anthropomorphic personification of the winter teletherm, in the spirit of Terry Pratchett's Discworld?”

And here's what ChatGPT said:

Name:

Sir Crispin Chill—The Wandering Frost (picture below per Gemini).

Appearance:

A tall, thin figure draped in an oversized, patchy coat made entirely of frost-laced scarves. His breath fogs the air, and his fingers leave frost patterns on everything he touches. His hat is made of icicles, and it drips ominously when he gets nervous.

Personality:

Sir Crispin doesn't particularly enjoy his job. He was once a punctual entity, back in the good old days when winter had a proper schedule, but now he's forced to arrive late, early, or in some cases, twice.² He carries a battered ledger of historical cold spells, grumbling about how they “just don't make winters like they used to.” He hates climate change—not because he's worried about the planet, but because it makes his job impossible. Every year, the higher-ups—The Bureau of Seasonal Affairs—send him new dates for his arrival, and they never match last year's schedule. He has an icy sense of humor,

²Excellent understanding of Teletherm dynamics!

mostly consisting of dad jokes about cold feet, snowballing problems, and things “not being what they used to be.”

Powers and Abilities:

Wherever he walks, the ground becomes briefly frozen—enough to make things slippery but not enough to be useful. He inconveniently drops snow flurries and cold gusts in inappropriate places (for example, inside your house). His walking stick is an icicle that keeps melting. Unlike other personifications like Death, Sir Crispin gets **little respect**.



Catchphrases and one-liners:

- — “Oh, for frost’s sake—again!?”

- “Cold, but not bitter . . . yet.”
- — “I was on time. Once.”
- “Winter is wherever I land.”
- “I don’t do warm welcomes.”
- “Unscheduled? Unacceptable.”
- “Ice to meet you. Again.”
- “Snow problem? I am the problem.”
- — “You can’t handle the cold!” (A Few Good Men)
- — “Say frosty one more time.” (Pulp Fiction)
- — “You had me at ‘forecasted frost advisory.’” (Jerry Maguire)
- — “I find your lack of layers disturbing.” (Star Wars)
- “I’m too old for this drift.” (Lethal Weapon)
- “The cold never bothered me anyway.” (Frozen — shameless, but true!)
- “I’ll be brrr-back.” (The Terminator)
- “I coulda been on time!” (On the Waterfront)
- “Winter moves pretty fast. If you don’t stop and check the almanac, you might miss it.” (Ferris Bueller’s Day Off)
- “Keep your friends close. . . and your scarves closer.” (The Godfather)

You can take in Teletherm knowledge at teletherm.org. We have a laptop and iPad set on at the back counter next the hot chocolate. The laptop is showing average minimum temperatures curves for a random sequence of over 1200

weather stations. The iPad has teletherm.org opened for a few places. Andy Reagan was the hero in putting it together, and we created some interactive visualizations that are distinct from what's in the paper. It's due for a refresh and some upgrades, so if you want another project ...³ We need to make it run automatically, stay up to date. The NOAA datasets are arcane, possibly of eldritch origin, but we've done the hard work there. (Of course, having said that, they'll have been transmuted into something else when we go back in. Or deleted altogether.⁴) And we need to extend it to weather stations around the world.

Okay, that's enough! Let's raise a something and wish ourselves a happy Hibernial Teletherm with a side of Groundhog Day.

³This is why we invited you graduate students.

⁴Because of the Awake Climate Cabal or something