

Acronyms Anonymous

Ultrafast optics is the study of ultrashort laser pulses and their many applications, from imaging to ultrafast spectroscopy. These pulses are the shortest technological events ever generated, and the shortness of a research group's pulses has over time become a universally accepted measure of its experimental prowess. As a result, we ultrafast-optical scientists have become utterly obsessed with generating the shortest possible pulses.

Coincidentally, we have published in a journal that allowed only ultrashort *publications* – no longer than three pages. To cram in everything we've needed to say, we've had to develop an equally obsessive practice of using short acronyms for our inventions. Every letter counts.

So when I solved the long-standing problem of measuring a high-resolution colour image of an ultrashort laser pulse, I had to choose an acronym for my technique. On a whim, I chose Frequency-Resolved Optical Gating: FROG. This new creature replaced an older method with a longer stodgy scientific name – autocorrelation – that only yielded a blurry black-and-white image of a pulse. Worse, for an unstable train of pulses, an autocorrelation trace also contained a short spike, called the “coherent artefact”, which was often confused for the actual, longer, pulse. In a field obsessed with bragging rights over the shortest pulse, this occurred far too often. Fortunately, FROG also solved this problem, always yielding the correct average pulse length.

Inspired by this success, my collaborators and I went on to also solve the problem of measuring very weak ultrashort pulses, and TADPOLE was born. Then a particularly elegant version of FROG gave birth to GRENOUILLE, and I formed a company to sell these devices to fellow scientists. Naturally, I called it Swamp Optics. Soon afterward, someone asked me what Swamp was an acronym for, and I suddenly realized that it wasn't an acronym at all. So I thought fast, blurted out “Simply Wonderful Apparatus for Measuring Pulses”, and all was well again in the swamp.

The acronyms were fruitful and multiplied. I invented a device for compressing pulses to shorter lengths, and the BOA Compressor slithered forth. A method for measuring the pulse versus time and space became STRIPED FISH. I became so well known for my acronymic prowess that a colleague asked me if I could help name his newly developed telecom network. A tradition of naming networks after famous artists had emerged and, at the time, networks named MONET and MANET existed. So I provided LEONARDO – which was on its way into the literature until my friend's boss caught wind of the fun and put a stop to it.

Another colleague invented a technique for measuring intense pulses at a focus. In a conference talk, he challenged me to provide the words to yield his desired acronym: the name of a prestigious French winery, CHATEAU PETRUS. Unfortunately for him, all in attendance decided that, if I succeeded, he should buy me a bottle from this winery, which cost an outrageous \$1000. Inspired by the challenge (and the reward), I quickly solved the problem and presented my solution at that evening's conference beer bash, where a highly inebriated audience approved unanimously. My colleague



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FROG's main competitors became SPIDER and its cousin ARAIGNEE (which stands for Another Ridiculous Acronym...)

turned out to be a man of his word, and he bought me a bottle. Unfortunately for me, I've now spent far more than \$1000 caring for this prized possession. On the other hand, when someone now asks me to develop an acronym, I simply respond, “Sure. You know my price.”

Eventually, competitors to FROG evolved in the ultrafast-optical pulse-measurement ecosystem, and the playful naming tradition continued. FROG's main competitors became SPIDER and its cousin ARAIGNEE (which stands for Another Ridiculous Acronym...). And the competition was fierce. In conference talks, slides showed frogs meeting grisly deaths by falling into whirling blenders, frogs viciously squashed while crossing busy streets, and large aggressive arachnoid beasts attacking poor defenceless little frogs. In addition, SPIDER seemed to yield shorter pulses – a critical selective advantage in this unique environment.

FROG was clearly losing the acronym war, caught in a web of fierce rivalry. But just as it seemed that my cute innocent frogs couldn't compete with much more ruthless – and faster – competitors, the competition migrated to another environment, a remote backwater in the ultrashort-pulse-measurement struggle for survival: mathematics. In this neglected wasteland, a few simple equations and simulations that had gone unnoticed for over a decade emerged, and they showed that FROG's new competitors measure only the nearly forgotten coherent artefact and so underestimate the lengths of pulses by unknowable amounts. Ultimately, for scientific measurement devices, survival of the fittest must operate on pure and simple accuracy. As a result, animal-kingdom food-chain issues notwithstanding, SPIDER's niche is now shrinking, and it may soon become the endangered species.

So do I regret spawning all those frivolous acronyms? As I sit here writing, surrounded by numerous generous gifts from fellow scientists, appreciative of the role my group's inventions have played in their work – stuffed-animal frogs, sticky rubbery frogs, a CD of frogs ribbiting and, of course, the wine – I'm inclined to say no. Most have found it a lot of fun, if a bit distracting.

On the other hand, in view of the above generosity, I'm thinking that my next invention will have the acronym CASH. I'm a little short at the moment.



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