

## Exquisite Failure: The Telescope as Lived Object

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### Abstract

We describe an exquisite mathematical failure, arrived at after hundreds of hours of solitary mathematical research, and offering no hope for mathematical redemption. The mathematical object at the center of the failure, the telescope denoted *Tel*, becomes a focal point for an idea-based art piece exploring the human relationship with darkness, history, and utopia. In this larger math-art theoretical space, *Tel* is reclaimed as a tool for critiquing mathematical ontology and reevaluating the terms of engagement of creative production.

### The Story of *Tel*

The second author, a mathematician, recently constructed an elaborate telescope, denoted *Tel*, in the derived category of a non-Noetherian ring  $\Lambda$  [1, 3]. The story is told in part of our piece, *Telescope*, presented in the art exhibition:

“The telescope *Tel* has some bizarre properties. I used it to answer an open question in tensor triangulated category theory; I showed that “Not every object in the derived category of a ring is Bousfield equivalent to a module.” The creation of this miraculous telescope, and the conjecture and proof of this theorem, entailed hundreds of hours of solitary work. No one besides me knew about their existence. In October 2012, I was days away from uploading a paper announcing this result to the world. A friend was checking my proof, and found a fatal flaw. The second equality on the last line of displayed mathematics in the lemma at the bottom of page six is not true<sup>1</sup>. The proof of this lemma, and the proof of the main theorem, collapses and is unsalvageable.”

No insight was gained in this failure. Our senses of truth and beauty have been bluffed. The theorem has fallen and shattered to pieces, and within the paradigm of mathematical research there is nothing to do but leave them untouched, forget, and move on.

### Abandoned by math, *Tel* finds a place in art

In its entirety, *Telescope* consists of a framed 24"x24" printed array of four images, laid flat and deliberately printed too small for the naked eye to decipher. A movable magnifying dome lens is placed

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<sup>1</sup> The mistake traces back to a false part of a proposition in a 1992 textbook on stable homotopy theory. Specifically, the second part of Proposition 7.2.6(iii) in [2] is false.

on the surface of the print so that the individual viewer can navigate and examine the page part by part. The print is accompanied by a 12-page stapled document. The document is the flawed preprint [4], written by the second author and ready for submission to a mathematics research journal but for the one incorrect line indicated above.

The four images are four representations of *Tel*. Two of them point to the objective dimension of *Tel*, a referent in formalism and visual language. The other two, texts, point to the human experience of *Tel*. The piece makes the bold claim that mathematical objects are fundamentally both objective and subjective, exist both outside and inside of time, and must be lived to be known.

The point of departure for the artwork is *Tel* itself, which is rigorously defined on page six of [4], but perhaps only truly exists and is known in the mind of the mathematician who constructed it. The print then exists as reification of the “posthumous” experience and contemplation of the failed mathematical object, unfolding into a larger discourse on creative practice and the dilemma (and opportunity) of failure. Instead of rejecting *Tel* immediately upon discovering its demise, doing everything we can to forget, and rushing on to the next promising hypothesis, we willingly absorb the failure as informing the human condition.

We, the practitioners, would submit that the failure of *Tel* is a valuable experience to be remembered rather than cast into the gutter of cultivated amnesia. It indelibly marks the mathematician's practice, just as any other chapter of personal history influences one's agency, one's future. It is naïve to think that the experiences surrounding creativity and production do not have an impact on turns in research, aesthetic decision-making, or even targeted results. It is impossible to maintain that these aspects of practice – scientific, academic, artistic, or otherwise – can or do exist outside of ourselves. *Tel* is just one more immutable link in the long, unruly chain of inventive progression.

## Epilogue

What does it mean to make a new place for this failed, beautiful object and reposition it in the context of art? If science, put simply, is a space of hypotheses, anonymous failures and magnified successes, then one could say art's task is to unburden itself from expectation, emancipate itself from the end result. Perhaps the artist doesn't even pose a hypothesis at all, but rather proposes a vision that includes failure as an accepted – even inherent, natural, necessary – possible outcome. In this frame, art practice can be a welcoming space for doomed visions, because this is just as much a part of our reality, our story, as the victories are.

## References

- [1] Dwyer, W.G. and Palmieri, J.H. *The Bousfield lattice for truncated polynomial algebras*. Homology Homotopy Appl. **10** (2008), no.1, 413-436.
- [2] Ravenel, Douglas C. *Nilpotence and periodicity in stable homotopy theory*. Appendix C by Jeff Smith. Annals of Mathematics Studies, 128. Princeton University Press, Princeton, 1992.
- [3] Weibel, Charles A. *An introduction to homological algebra*. Cambridge Studies in Advanced Mathematics, 38. Cambridge University Press, Cambridge, 1994.
- [4] Wolcott, F. Luke. *Not every object in the derived category of a ring is Bousfield equivalent to a module* (2012), available at arXiv:1202.6494. preprint.