Writing about Research: *Physics Today's* Publishing Process

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Physics Today

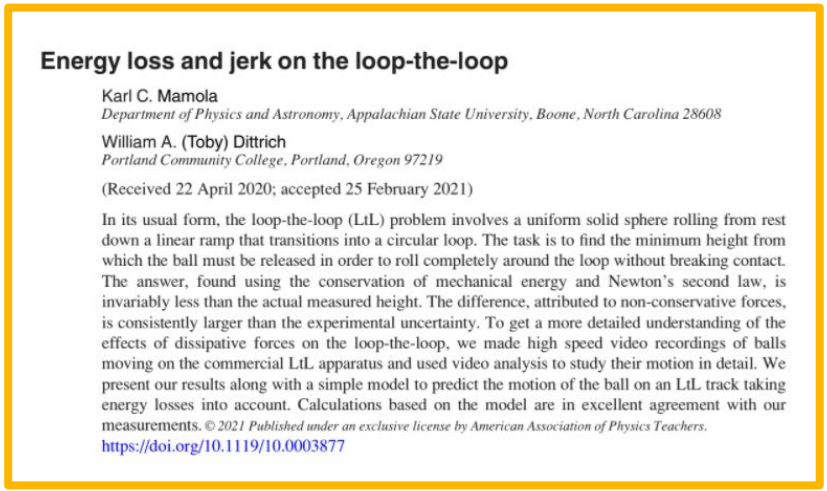
- **Published by AIP**
- **Written for the physics community**
- **Many editors have PhDs**
- **Magazine and online**

The Writing Process

1. Research
2. Writing
3. Editing

Research: Finding a Story

- Where do we look?
- How do we identify possible stories?
- How do we pick one to write about?



Energy loss and jerk on the loop-the-loop

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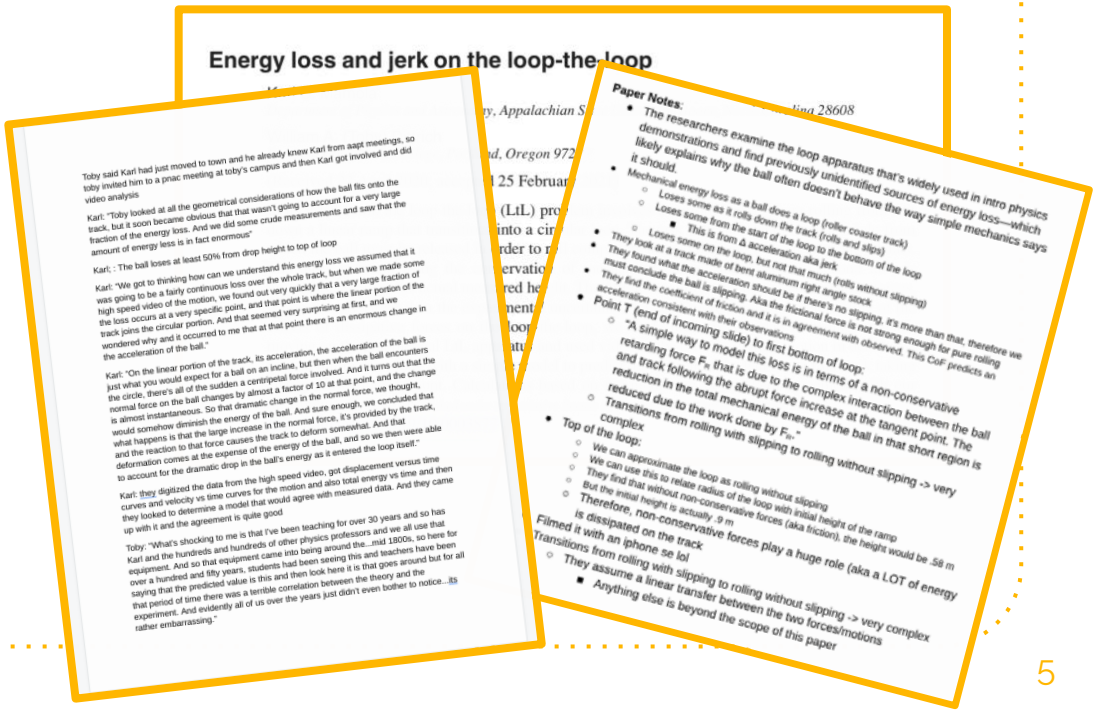
In its usual form, the loop-the-loop (LtL) problem involves a uniform solid sphere rolling from rest down a linear ramp that transitions into a circular loop. The task is to find the minimum height from which the ball must be released in order to roll completely around the loop without breaking contact. The answer, found using the conservation of mechanical energy and Newton's second law, is invariably less than the actual measured height. The difference, attributed to non-conservative forces, is consistently larger than the experimental uncertainty. To get a more detailed understanding of the effects of dissipative forces on the loop-the-loop, we made high speed video recordings of balls moving on the commercial LtL apparatus and used video analysis to study their motion in detail. We present our results along with a simple model to predict the motion of the ball on an LtL track taking energy losses into account. Calculations based on the model are in excellent agreement with our measurements.
https://doi.org/10.1119/10.0003877

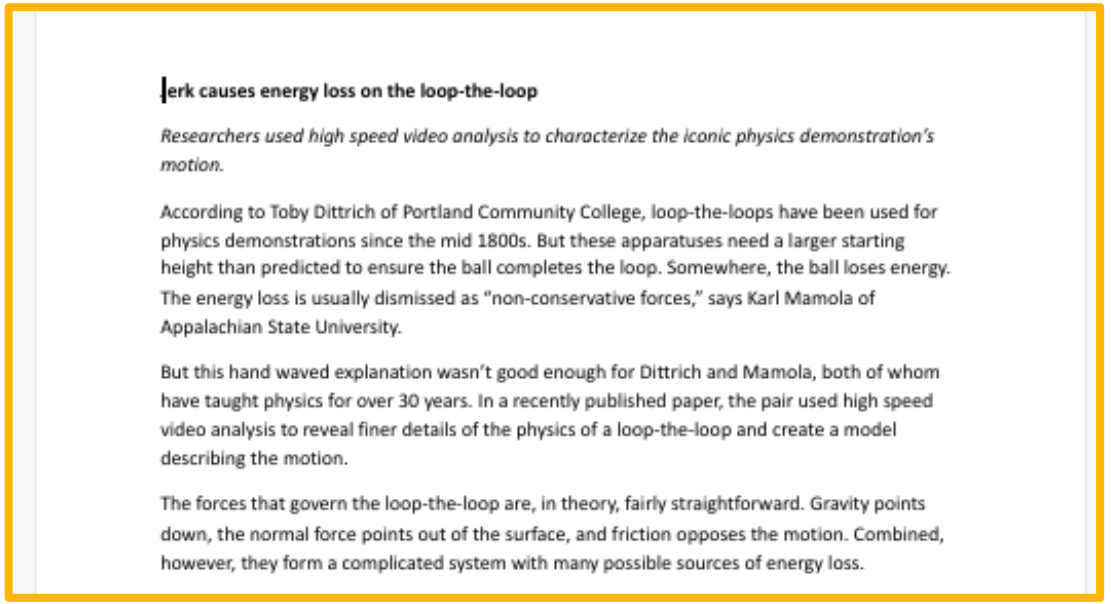
Research: Gathering Info

- Academic paper
- Paper notes
- Interview quotes
- Other resources



Writing: Words on the Page

- Outlining
- The story's angle
- Introduction
- Transitions
- Conclusion



erk causes energy loss on the loop-the-loop

Researchers used high speed video analysis to characterize the iconic physics demonstration's motion.

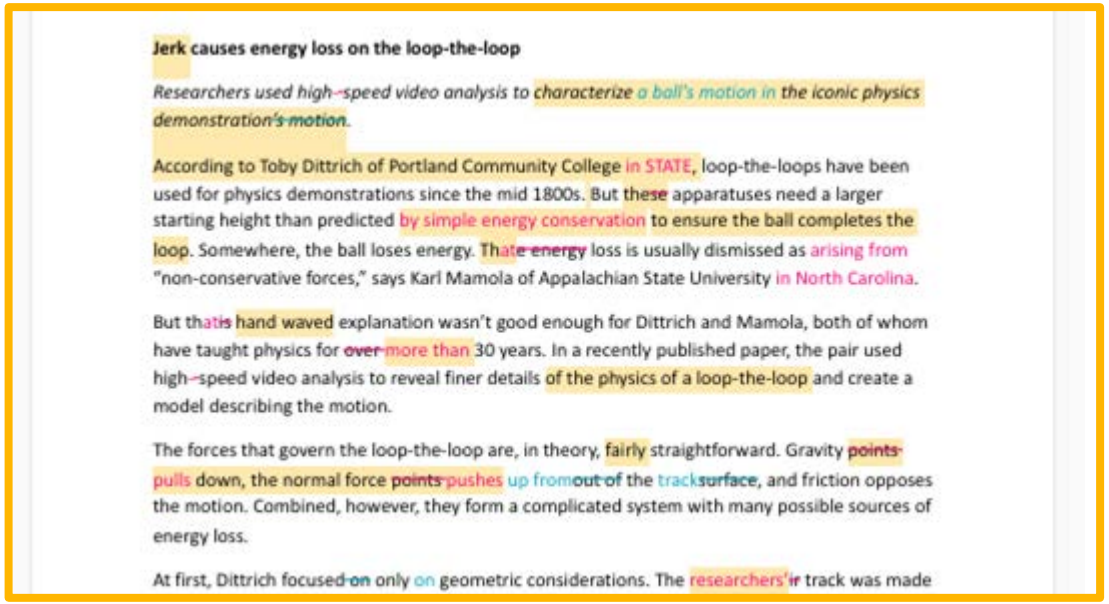
According to Toby Dittrich of Portland Community College, loop-the-loops have been used for physics demonstrations since the mid 1800s. But these apparatuses need a larger starting height than predicted to ensure the ball completes the loop. Somewhere, the ball loses energy. The energy loss is usually dismissed as "non-conservative forces," says Karl Mamola of Appalachian State University.

But this hand waved explanation wasn't good enough for Dittrich and Mamola, both of whom have taught physics for over 30 years. In a recently published paper, the pair used high speed video analysis to reveal finer details of the physics of a loop-the-loop and create a model describing the motion.

The forces that govern the loop-the-loop are, in theory, fairly straightforward. Gravity points down, the normal force points out of the surface, and friction opposes the motion. Combined, however, they form a complicated system with many possible sources of energy loss.

Editing: It's Brutal

- Does it make sense?
- Does it sound good?



Jerk causes energy loss on the loop-the-loop

Researchers used high-speed video analysis to characterize a ball's motion in the iconic physics demonstration's motion.

According to Toby Dittrich of Portland Community College in STATE, loop-the-loops have been used for physics demonstrations since the mid 1800s. But these apparatuses need a larger starting height than predicted by simple energy conservation to ensure the ball completes the loop. Somewhere, the ball loses energy. That energy loss is usually dismissed as arising from "non-conservative forces," says Karl Mamola of Appalachian State University in North Carolina.

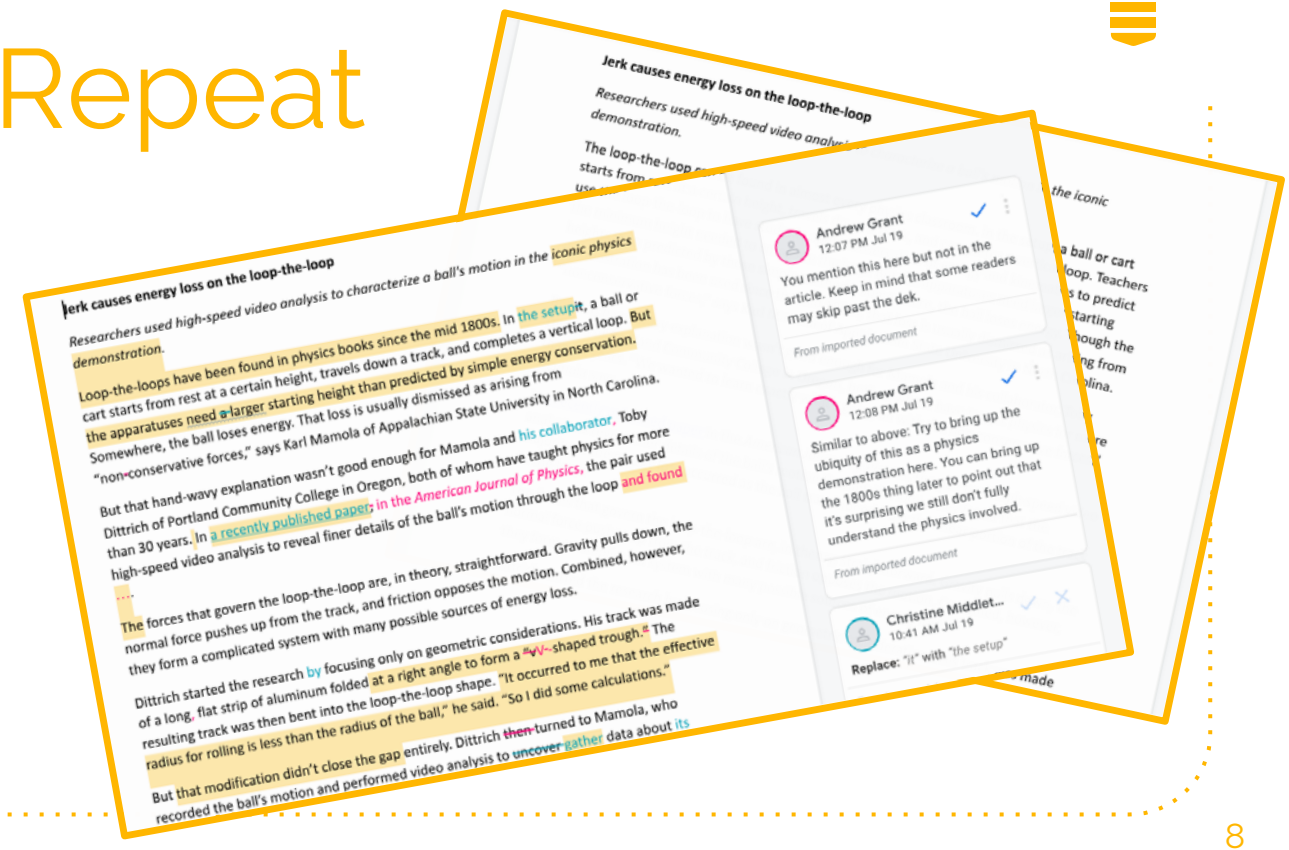
But that is hand waved explanation wasn't good enough for Dittrich and Mamola, both of whom have taught physics for over more than 30 years. In a recently published paper, the pair used high-speed video analysis to reveal finer details of the physics of a loop-the-loop and create a model describing the motion.

The forces that govern the loop-the-loop are, in theory, fairly straightforward. Gravity points pulls down, the normal force points pushes up from out of the track surface, and friction opposes the motion. Combined, however, they form a complicated system with many possible sources of energy loss.

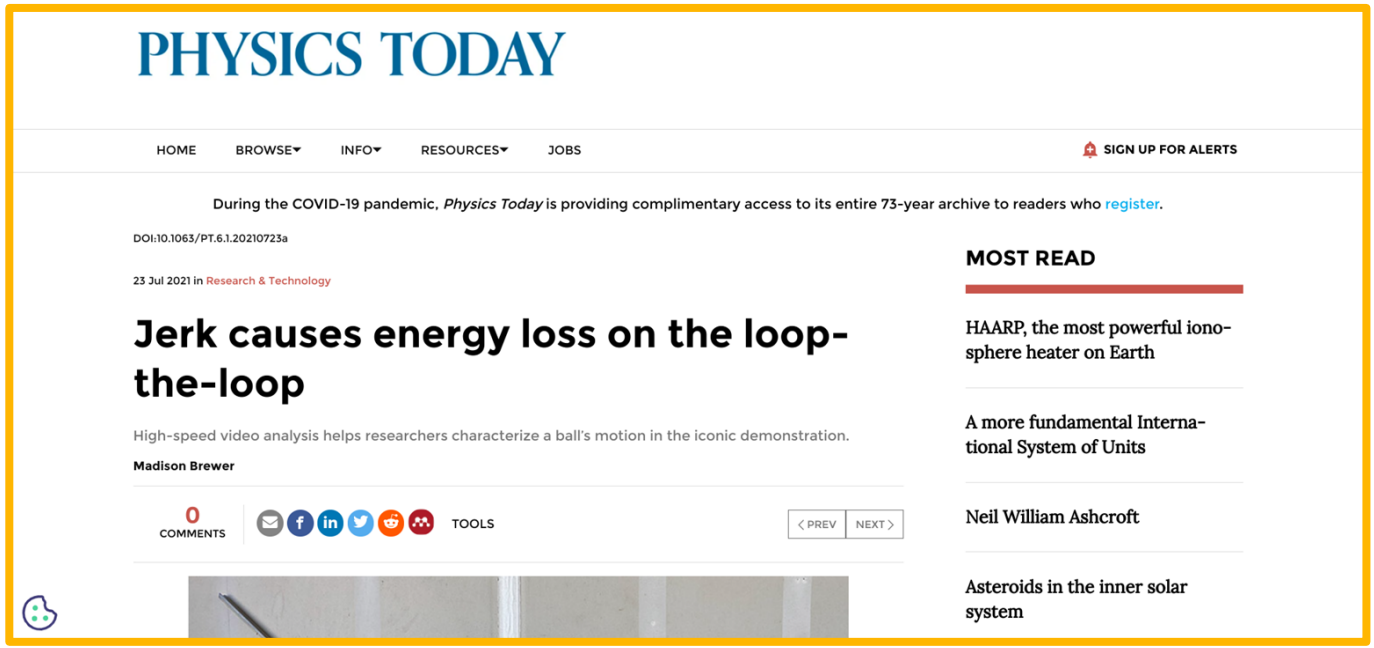
At first, Dittrich focused on only on geometric considerations. The researchers' ir track was made

Editing: Repeat

- Editors
- Researchers
- Copy editing
- Proofreading



Finally Posted!



Acknowledgments

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Thanks!

Any questions?