



Class Notes from Geometric Physics 101

Arthur J. Stewart

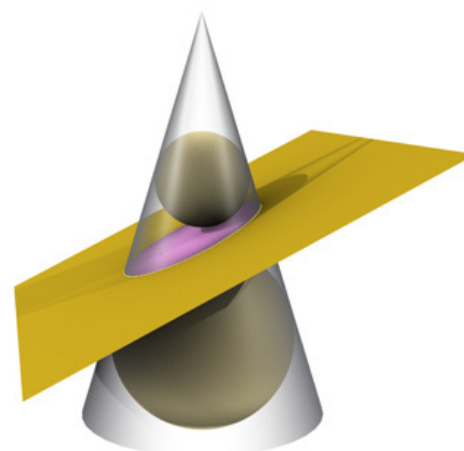
Abstract

Long ago, the author took high school courses in Physics and Geometry. Our long-suffering teachers tended to talk somewhat faster than we could comfortably write, so inevitably some factual errors crept into our study notes. And we weren't really very good students at that age, either, which I'm sure didn't help. In any case, in "Class Notes..." I try to capture my sense of things when trying to rapidly learn a lot of new information, while lacking good idea-distillation and writing skills. How many technical errors can you find in this poem?

Class Notes from Geometric Physics 101

Lesson 1.

1. A line is the straightest distance between two points. A point takes no space. Space curves.
2. The line carried becomes an arc, the arc an ellipse, the ellipse a right circular cone. A circle is a special ellipse, the square is a special rectangle. Two lines intersect to make angles; opposite angles are equal, adjacent, add. Four makes a circle; the circle, a curved line.
3. Velocity is a vector, a line with direction and length. Speed is distance over time, and great speed slows time.
4. Mass is an energy lump; mass moves in a straight line, a long light arc. Energy lumped times light times light is energy.
5. Gravity makes a black hole black. Mass falls in & makes energy. Energy moves like light, & light makes matter. Matter moves & makes a line; the point is time.



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Lesson 2.

Acceleration is a, a change in velocity.
 Force makes mass accelerate. Mass accelerated
 releases energy, energy released makes heat, &
 heat makes matter move. Heat
 moves in a circle.

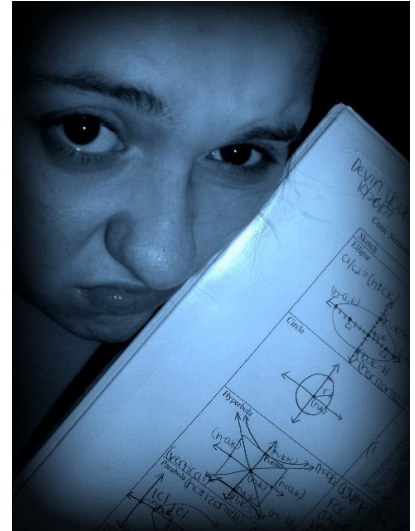
Velocity is direction & speed;
 spinning matter at a constant speed
 accelerates a circle & gives off energy;
 energy matters.

Stars that spin
 give off energy that moves to meet matter.
 Moving matter takes time & needs force.

A black hole
 is a massive star that consumes matter.
 Matter consumed releases energy that moves like light.
 Mass makes gravity, gravity moves light along a line,
 & light has no mass. Spinning stars
 accelerate gravity in a circle; a mass moves

along an arc of points. Stars spin
 from point to point
 through space & accelerate gravity;
 gravity moves matter & accelerates mass
 to a point along a line, an arc, a circle.

Light moves.



Devin Young (2008) "Sometimes I think
 this cycle never stops. CC BY 2.0.
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Lessen 3.

Schrödinger still dreams restlessly
of waves pitching endlessly on a black ocean;
Heisenberg was more

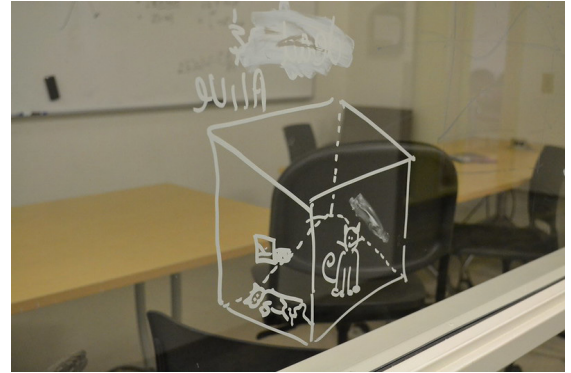
: uncertain :

Plank surely had a good hard think
about quanta, and Bohr
perceived the relentless spin of matter
(plus, zero, minus), remember that.

Uncertain waves spin certainly to make
matter & light. Waves have height
& length; light & gravity
move as waves, & moving matter
is light times light. Energy happens.

1st Einstein lumped light & matter
& accelerated matter along gravity
to a line meeting at time squared.
Then Hawking energetically mixed matter
in a black hole spinning along points
moving near the speed of light at the edge of time &
space happens.

==> (Test on Tuesday!) <==



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Author's Note: In writing "Class Notes..." I was thinking back to my high school days, when I took a course in Physics and a course in Geometry the same term. Our long-suffering teachers tended to talk somewhat faster than most students could comfortably write, so inevitably some factual errors crept into our fragmented notes. And honestly, none of us were very good students at that age, which I'm sure didn't help. In any case, in this poem I try to capture a student's initial intimidation and sense of things when struggling to rapidly learn a lot of new information, while lacking good idea-distillation and writing skills. As I hope you'll see, it is meant to be humorous. S/he starts note-taking very carefully, even numbering important points, and in Lesson 1, the topic moves tidily from predominately geometry to predominately physics. Later in the term, the student is more comfortable and casual with their learning: some shortcuts are invoked ("&s" rather than "ands"). Also in Lesson 2, the topics shift more towards large-scale physics, and some of the important points are almost accurately expressed: the student is more confident about their learning, and the lecture topics are captured in note form in more complete statements—even though important errors still creep in. Lessen 3 (deliberately spelled wrong) has a very different flavor. The student's learning effort now is 'lessen', even as deeper learning happens, and the physics ideas are broader, concept-rich, and more abstract. There also is more attention on the scientists who conceptualized these big ideas. But then, reality slams back in: Test on Tuesday!

Author

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