



"Black Hole" – Drawing by Shantel S., DDC'23

In this December 2021 Issue:

1. Spotlight on:

- Duchesne Drew (CC'89) was elected to the [Board of Trustees of Columbia University](#). Duchesne volunteered at DDC as a mentor and tutor while he was studying at Columbia. After graduation, he spent two years working as a development officer for the Center.

Congratulations Duchesne!

2. How to Fall in Love with Physics!

3. All Things ALUMNI

2. How to Fall in Love with Physics!

So many students dread physics, says Fernanda Albuquerque de Araujo, Doctoral Candidate in Science Education in the Department of Mathematics, Science and Technology at Teachers College. They see it as a tough subject with lots of mathematical formulas to memorize and intricate concepts to understand. This class introduces students to the magic of physics – the rules that govern the physical world – and show them how the technology they take for granted in their everyday life – from the New York subway to their kitchen appliances – illustrates basic laws of the universe. Once they understand these laws, they can easily learn the equations and formulas that measure their interactions. The course uses easy-to-understand language, simple experiments, and engaging interactive simulations such as [this animated illustration of energy forms and changes](#) from the PhET project at the University of Colorado Boulder, developed in 2002 by Nobel Laureate Carl Wieman to teach students about science and math.

Many great discoveries in physics began with everyday situations, explains Fernanda. For example, apples falling from a tree spurred Newton to develop its law of gravity. This program shows students the wonders of the world around us, sparks their imagination and interest for science and in the process, sharpens their critical and analytical thinking for a lifetime of learning, she adds. Topics include the study of motion (kinematics) such as distance, velocity, acceleration, and displacement; dynamics, such as forces, mass and inertia; and the physics of heat (thermodynamics) such as temperature, transfer of energy, conduction, and radiation. And once they discover that science can be fun, they want to take more STEM classes, says Fernanda.

Confused by the law of inertia, Newton's first law of motion? – if a body is at rest, it will remain at rest or keep moving in a straight line at constant speed, unless acted upon by an external force. *Remember your subway ride today, says Fernanda. As the train leaves the station and accelerates, your body is thrown backward because it remains at rest while the train starts moving. When the train slams the brakes as it approaches a station, your body is thrown forward because it keeps moving at the same speed and direction as the train before it slowed down. And voilà! Newton's Law of Inertia in the subway!*

How about the concepts of heat exchange and heat capacity? Blow a balloon, put a lit candle underneath, the balloon pops. Blow another balloon, add water at the bottom, put the same lit candle under the balloon filled with water... the balloon blackens but it does not pop! *The heat is transferred to the water through the balloon. As the water absorbs the heat from the flame, it keeps the temperature of the balloon below its melting point, preventing it from popping, says Fernanda. Now that students have seen in action these concepts of thermodynamics, they are ready to learn the formulas that measure the relationships between heat transfer and the specific heat capacity of an object.*

Conceptual Physics is the most popular class this fall at DDC! It is so exciting for me to see the students embrace this approach to physics, says Fernanda. They are engaged and passionate, and they have been so resilient and patient during these months of online learning. It is a pleasure to work with such creative and interested students.

Students' final projects include a presentation on the "Physics Behind a Black Hole" by Shantel S., DDC'23, and Giada R., DDC'23 – [Click here to read the outline](#) – and "How Physics is Related to Cooking" by Kalid C., DDC'22.

DDC students review the class *Conceptual Physics*:

- **Emmanuel M., DDC'24**
Concepts in physics are freaking cool!
- **Shantel S., DDC'23**
Physics is amazing, I want to learn quantum physics! Just for fun, I want to see how formulas tie into conceptual physics.
- **Kalid C., DDC'22**
I really enjoyed the activities we did to understand the concepts. I want to know more about heat – heat flow, heat transfer, specific heat capacity, etc.

3. All Things ALUMNI

On behalf of everyone at DDC, I would like to wish you all a safe and wonderful holiday! Thank you to those who have participated in our questionnaires and will be volunteering with us next semester!

Here are events that are coming up for you all in the Spring:

1. Graduate School Entrance Exam Test Prep (GRE, LSAT, GMAT, and MCAT)
2. Career Workshops (Resume, Interview, Negotiations)
3. Career Panels (with possible internships and job openings)
4. Financial Literacy Events

Stay tuned for our emails.



For any other alumni related questions, please email [Yarisell Hernandez](mailto:Yarisell.Hernandez)

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