

Saint Peter's College

Newtonstein Article

“Heat Convection”

Special points of interest:

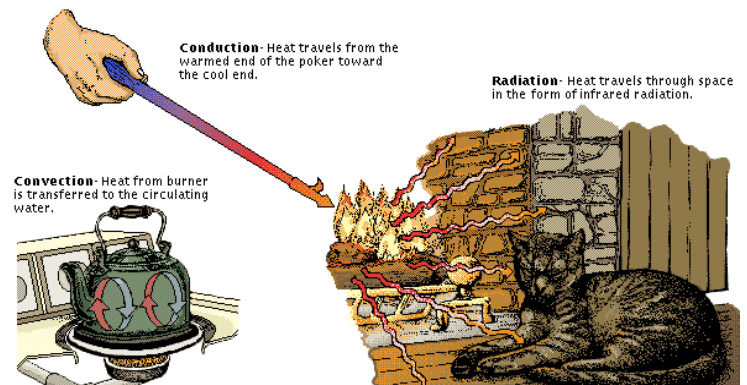
- Community Service project is coming up on Saturday, May 3, 2008
- Also, students need to be thinking about a possible date to do the monthly experiment.
- The End of the Semester Barbeque
- Last meeting is next week.

So, finally we are about to do a monthly experiment. This will be lots of fun. Now, like everybody mentioned at the last meeting, members need to first learn “WHAT IS HEAT CONVECTION”?

Heat Convection is a process by which energy in the form of heat is exchanged between bodies or parts of the same body at different temperatures. Heat is generally transferred by convection, radiation, or conduction. Although these three processes can occur simultaneously, it is not unusual for one mechanism to overshadow the other two. Heat, for example, is transferred by conduction through

the brick wall of a house, the surfaces of high-speed aircraft are heated by convection, and the earth receives heat from the sun by radiation.

If you still don't understand, look at the following picture:



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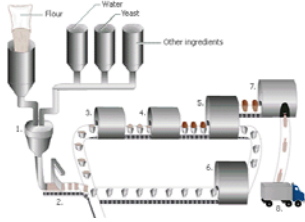
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As seen in the picture above, convection transfers heat through the exchange of hot and cold molecules; this is the process through which water in a kettle becomes uniformly hot even though only the bottom of the kettle contacts the flame.

Now, our experiment deals with knowing how these properties work. This meeting focuses on what our experiment is about and how members can play a role in conducting the Monthly Experiment.



What is Convection?



Here, is convection on an industrial scale.

Conduction occurs not only within a body but also between two bodies if they are brought into contact, and if one of the substances is a liquid or a gas, then fluid motion will almost certainly occur. This process of conduction between a solid surface and a moving liquid or gas is called convection. The motion of the fluid may be natural or forced. If a liquid or gas is heated, its mass per unit volume generally decreases. If the liquid or gas is in a gravitational field, the hotter, lighter fluid rises while the colder, heavier fluid sinks. This

kind of motion, due solely to non-uniformity of fluid temperature in the presence of a gravitational field, is called natural convection. Forced convection is achieved by subjecting the fluid to a pressure gradient and thereby forcing motion to occur according to the law of fluid mechanics.

If, for example, water in a pan is heated from below, the liquid closest to the bottom expands and its density decreases; the hot water as a result rises to the top and some of the cooler fluid descends

toward the bottom, thus setting up a circulatory motion. Similarly, in a vertical gas-filled chamber, such as the air space between two window panes in a double-glazed, or Thermopane, window, the air near the cold outer pane will move down and the air near the inner, warmer pane will rise, leading to a circulatory motion.

“People go through life wondering why physics gives us practical results, but no one questions how one arrives at getting these practical results”

How should members choose Roles?

Each role in a Monthly Experiment involves certain duties. Like, for example, the person who prepares the material, makes sure that everything is in place, that’s an important job. Another role is to understand the material, how to put the design together, and explain what is happening. Last, someone who has video recording experience,

to record what is happening, comments, or anything important that might have happened.

One can say that these job’s are important, but everyone depends on each other to get the experiment undergo. So, we all help each other out in the best way possible. Our goal is to learn something folks. Perhaps the first time will be good practice for future monthly experi-

ments, but one thing to always have in mind is, “Have fun and remember that others will see it”.

Princeton Plasma Labs



Come on, try it, “This will make you strong and evil”.

One thing that I’ve been looking at is trying to visit the Princeton Plasma Labs. Members need to be exposed to the work that is going on there. Everyone can read about research, but to be there in front of those scientists who have a strong passion for

what they do is another story. For those who went to Penn State, it was evident on the trip to the Nuclear Reactor. The scientists there knew what it was, and how one uses it for good reasons. So, this is an idea to put out there. I want to have a trip

perhaps sometime in the summer if it’s possible. Or maybe we can make this a possible event next semester. Let’s all get together and think about it.

SPS Zone 3 & 7 conference at SPC

So, students have been asking me, "Are we really going to have a conference next year?" Well, the answer is, "It all depends on us". We need to get motivated, and tell people about it. Our society can only do so much, we need to fundraise, or put together some great ideas. But, most importantly, we need to stay in touch with other societies so they know our plans. The national Society of Physics Stu-

dents tells us that we need to publicize and complete with other colleges. So, in other words, we will do our best to bring the conference here to Saint Peter's College. As president, I will contact all those needed to make it possible, but I will need help from all the officers and members to finalize the event. So, let I mentioned previous, "Depending on how much work we put into this event, it

will determine if we have it or not".



November's Sigma Pi Sigma National Congress Meeting

This November is the biggest event of the century, it's the national sigma pi sigma congress meeting at Femilabs. For those who didn't know about Femilab, well you're lucky to learn about it now:

The Fermi National Accelerator Laboratory is a high-energy physics research center, dedicated to exploring the field of elementary

particle physics. Also called Femilab, the center is located near Batavia, Illinois, and is operated for the United States Department of Energy by Universities Research Association, Inc., a consortium of universities in the United States, Japan, and Canada. The laboratory is named for Italian American physicist Enrico Fermi, the first scientist to achieve a controlled nuclear reaction.

Research at Femilab is performed by directing a high-energy beam of particles at a stationary target, or by colliding beams of protons and antiprotons. The results of these collisions provide information about quarks and bosons, the fundamental building blocks of protons, and thus help scientists understand the structure of protons.

Come on, go here, go there, remember that life takes you by surprise, when you least expect it, and when you never know.

(Cont.)

Femilab's primary instrument is the Tevatron, a particle accelerator called a proton synchrotron. It is located in a circular underground tunnel with a circumference of 6.3 km (3.9 mi). Another accelerator, the Main Ring, began operating in 1972 and now serves as an injector for the Tevatron, the most power-

ful accelerator in the world. The Tevatron is capable of accelerating particles to energies of 1 trillion electron volts (TeV). A new injector is scheduled to replace the aging Main Ring in 1999, increasing the number of particle collisions by 500 percent. In 1978 a team of scientists at Femilab

discovered the bottom quark and its associated antiquark. The top quark, the heaviest and most elusive quark predicted by the standard model, was discovered at Femilab in 1995.

The last meeting will be on: **May 7, 2008**
Samik Adhikari (Vice-President) will be
conducting the meeting.

We've on the Web!
<http://www.spc.edu/SPS>

Email our Secretary at:
tmaldonado@spc.edu

What next? Well, the semester is almost over. Hope that everyone enjoyed the meetings, events, & other fun activities that were planned. Next semester there will be more things happening, so fast, that some of you might not keep track.

It seems that helping each other, we can indeed make our society fun for everyone. People say to me, "What makes a good society?" The answer is short and simple, "Members who really care about what is happening around them, and who love to inspire the young generation". Besides these small comments, please email me on the last day of classes, and let me know what you think about the society, what changes you want to see be made, or anything that you might have concerns on. Let me know how our society can plan events, and trust me, every word makes all the difference next semester.

Hello my name is Tony,
I am here to help out any member who needs advice on something, please don't be angry to come see me about anything. I will keep emailing members about the meetings, but starting next semester I will be assisting David with the website, so email me and thanks so much for making this semester lots of fun.

Your Friend,
Tony (SPS Secretary)

"End of Semester Barbeque"

Finally, the Barbeque for our members. Well, one thing is for sure, we will not end the semester on a bad note, NOPE never happening. So, I've decided to have a barbeque for everyone at an later announced location on Friday May 23, 2008 at 12:00 noon. At the event, we will have a guest speaker, who will remain anonymous for now. I want to surprise everyone, so you guys will enjoy it. Now, the invitations will send out as soon as final exams are over. Also, the society will be presenting an award to someone, and a small tribute will be made to the society for the success it's had

this semester. Nobody who is a member wants to miss this event, t-shirts will also be given out with the name of each member. "Big News" also will be announced on that date. Finally, the last issue of our article will be handed out. Who knows, it might not even be our article but something much better. The day is full of surprises, activities, awards, and a guest speaker to end the semester. Hope everyone enjoys it.

