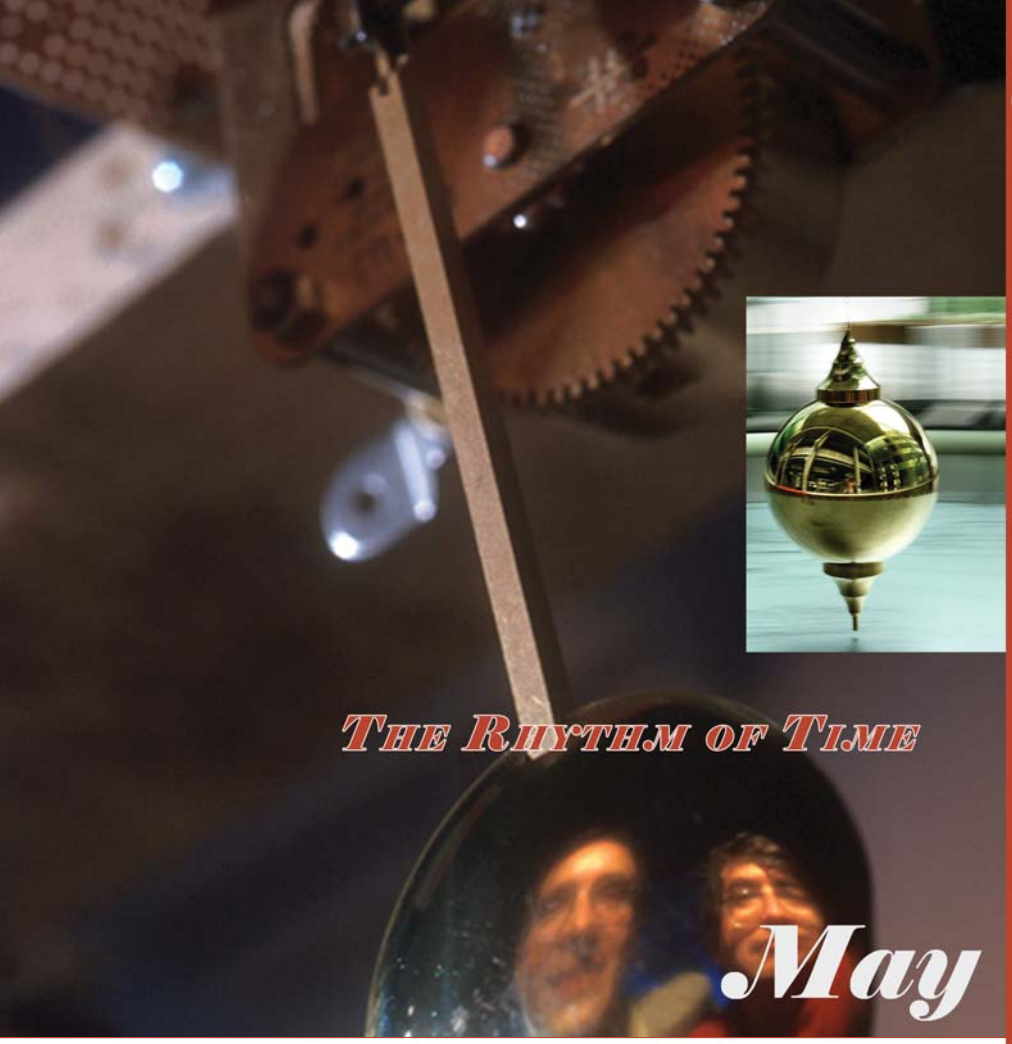

The Rhythm of Time

May 2009

> *"We cannot teach people anything; we can only help them discover it within themselves."*
>
> Galileo Galilei

April 2009

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

June 2009

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Physics Question — A simple pendulum with length L has a period of 1 second when the acceleration due to gravity is g. Calculate the new period of the pendulum (in seconds) if its length is increased to 2L and gravitational acceleration decreases to g/8.					**1** ***National Science Bowl® Washington, DC***	**2** SAT and Subject Test Date ***National Science Bowl® Washington, DC***
3 ***National Science Bowl® Washington, DC***	**4** IB Exams Begin ***National Science Bowl® Washington, DC***	**5** Registration Deadline for June SAT ***National Science Bowl® Washington, DC***	**6**	**7**	**8** Registration Deadline for June ACT	**9**
10 Mother's Day	**11**	**12**	**13**	**14** Edward Ricketts' Birthday	**15**	**16**
17	**18**	**19**	**20**	**21**	**22** IB Exams End	**23**
24/31	**25** Memorial Day	**26**	**27**	**28** Shavuot (Begins at Sundown)	**29**	**30**

A: 4 SECONDS [Solution: $2\pi\sqrt{(L/g)} = 1$ so $2\pi\sqrt{(2L)/(g/8)} = 4$]

http://nationalsciencebowl.energy.gov • www.nosb.org

As a teenager, Galileo made an amazing discovery while listening to mass in a cathedral one day. Looking up, he spied a chandelier swinging back and forth in the breeze overhead, sometimes in large arcs and sometimes barely stirring. He timed the chandelier swings with his pulse. No matter how far the chandelier moved, it took the same number of pulse beats for the chandelier to make a complete swing. Thus, the basic idea of measuring time with a weighted swinging device was formed.

Galileo recognized the pendulum's potential for keeping time, but he died before his work could be completed. Christiaan Huygens further developed Galileo's ideas and built the first successful pendulum clock in 1656.

In 1665, Huygens noticed that two of his pendulum clocks were beating in unison, and no amount of interference would affect this synchronization. Huygens' recorded experiments on his clocks were believed to be the first on synchronized oscillators.

Recently, physicists at the Georgia Institute of Technology recreated Huygens' experiments. They hope to learn more about modern synchronized oscillators and perhaps apply this knowledge to modern devices like lasers and superconducting electronic systems. Two of the men who worked on this experiment, Dr. Kurt Wiesenfeld and Dr. Michael Schatz, are reflected in the pendulum pictured above.

Credits: Pendulum courtesy of Gary Meek, Georgia Institute of Technology; "eppur si muove"(thumbnail) courtesy of Josef Stuefer, http://www.flickr.com/photos/josefstuefer; Simple pendulum height (below) courtesy of www.wikipedia.org