



# BLACK PINE CIRCLE SCHOOL

A SCHOOL OF THOUGHT

**Presents**

A Parent and Public Education Evening

## “ANTIMATTER: UNDERSTANDING AND EXPLORATION”

An Evening of Conversation with Professor Joel Fajans About His Team’s Recent Success in Trapping Antimatter

Moderated By Doug McConnell of *Bay Area Backroads*

Tuesday, January 25th 2011, 7:30 pm-9:00 pm

Location: **Black Pine Circle School Library** 2027 7th Street (between Addison St. and University Ave.) Berkeley, CA

**AN IMPORTANT MOMENT IN SCIENCE:** Berkeley physicists seeking to pierce a mystery as old as the universe joined an international team of scientists on November 18th, 2010 to report they had trapped and stored a few dozen atoms of antimatter — the stuff that annihilates ordinary matter in a single explosive flash of energy. Cosmologists have long believed that the Big Bang produced exactly equal amounts of antimatter and ordinary matter. All of this matter and antimatter should have annihilated, leaving nothing left over. But while all the antimatter did indeed disappear, enough of the matter was left over to form all the galaxies, stars and planets that we observe today. No one knows why some of the matter was left over. “It’s one of the fundamental mysteries of the Big Bang”, Joel Fajans reported, “and now that we know how to store it, we’ll soon have enough atoms of antimatter to hold in our hands long enough to study questions like how it behaves in real-world gravity, what its fundamental role was in the evolution of the universe, and how it behaves when we excite it with laser beams.” (*SF Chronicle, November 2010*)



**ABOUT MODERATOR DOUG McCONNELL:** From 1993-2009 Doug McConnell was the Host and Senior Editor of the *Bay Area Backroads* television series on KRON Television in the San Francisco Bay Area. *Backroads* was one of the longest-running regional television series in American broadcast history, and was consistently the highest-rated locally produced, non-news program in the nation’s sixth-largest

market. During his *Backroads* years, McConnell co-authored two best-selling travel publications for Chronicle Books. McConnell received a Master’s degree in Political Science from the Eagleton Institute of Politics at Rutgers University (1968), and a Bachelor’s degree in Government from Pomona College (1967). Since 1983, McConnell has lived in the Bay Area with his family and a bevy of pets. He maintains a busy schedule of community activities and was honored recently by the Marin Humane Society as “Humanitarian of the Year,” by the San Francisco Bay Trail Project as “Volunteer of the Year,” by California State Parks as “Honorary Ranger of the Year,” and by the National Park Service as “Honorary National Park Ranger.” McConnell has received many regional Emmys and other broadcast awards during his long career in television. In addition, McConnell has been given the prestigious Harold Gilliam Award for environmental reporting and storytelling in Northern California. McConnell’s most recent venture is the creation of an online travel community called *OpenRoad.TV with Doug McConnell - The Traveler’s Video Guide to the American West*. *OpenRoad.TV* will be stocked with all the video, knowledge and insights that McConnell has compiled over the years, and that he continues to collect.



**ABOUT PROFESSOR FAJANS & HIS RESEARCH:** Joel Fajans, father of two Black Pine Circle School students, is a physicist at the Lawrence Berkeley Laboratory and a Professor of physics at UC Berkeley, as well as a member of a physics team at CERN (in Geneva) called the Antihydrogen Laser Physics Apparatus, or APLHA.

“Although most of the universe is in the plasma state, the basic properties of plasmas are not well understood. Plasmas are collective systems, and exhibit remarkably complicated nonlinear behaviors like turbulence and chaos. Better understanding of basic plasma physics should help us in areas as diverse as astrophysics and plasma processing.”

Professor Fajans’ group studies an unusual type of plasma—non-neutral plasmas. Such plasmas consist of particles of only one sign of charge: typically electrons, ions, positrons, or antiprotons. Since non-neutral plasmas are extraordinarily stable, readily controllable, and easily diagnosed, they are ideal for many basic plasma physics experiments. In addition, non-neutral plasmas can be used for experiments on fluid dynamics nonlinear dynamics and antihydrogen formation. As non-neutral plasmas are confined in small- scale traps, experiments are run by one or two people.

socrates.berkeley.edu/~fajans  
<http://alpha.web.cern.ch/alpha/>