



<http://kicp-workshops.uchicago.edu/hem2014/>

WORKSHOP PROGRAM

The Kavli Institute for Cosmological Physics (KICP) at the University of Chicago is hosting a workshop this summer on the origin of the non-thermal extragalactic backgrounds. The goal is to bring together observers and theorists representing all the high-energy wavebands and particles: radio, GeV and TeV gamma rays, and extragalactic cosmic rays and neutrinos. Topics will include isotropic diffuse intensity measurements, resolved extragalactic source populations and their collective contributions below the individual source detection threshold, anisotropies, and propagation effects and secondary cascades.

Example focus questions:

- * Is there a coherent scenario which explains all the current observations in terms of established extragalactic source populations?
- * What are the next steps (experimental + theoretical) to move past current uncertainties/degeneracies?

We are planning a three-day workshop for about fifty participants convening on the campus of the University of Chicago. Each day will consist of plenary presentations with plenty of time for discussion in large and/or small groups.

Workshop Topics:

- * Radio, gamma rays, neutrinos, UHECRs
- * Isotropic diffuse intensity measurements
- * Resolved extragalactic source populations and their collective contributions below the individual source detection threshold
- * Anisotropies
- * Propagation effects and secondary cascades

Organizing Committee

Keith Bechtol

Kavli Institute for Cosmological Physics

Ke Fang

Kavli Institute for Cosmological Physics

Toshihiro Fujii

Kavli Institute for Cosmological Physics

Dan Hooper

U Chicago/FNAL

Tim Linden

Kavli Institute for Cosmological Physics

Angela Olinto

University of Chicago

Abigail Vieregg

University of Chicago

WORKSHOP PROGRAM

June 9-11, 2014 @ University of Chicago

Monday - June 9, 2014

Welcome

OBSERVATIONAL STATUS & ISOTROPIC DIFFUSE MEASUREMENTS*Chair: Toshihiro Fujii*

- 9:10 AM - 9:30 AM Jack Singal, University of Richmond
The Cosmic Radio Background - Five Years of an Enigma
- 9:30 AM - 9:50 AM Alan Kogut, NASA / GSFC
The Case for a Bright Extragalactic Radio Background
- 9:50 AM - 10:10 AM Keith Bechtol, Kavli Institute for Cosmological Physics
Spectrum of the Isotropic Diffuse Gamma-ray Background from 100 MeV to 820 GeV
- 10:10 AM - 10:30 AM Miguel A Mostafa, Penn State
First results from the HAWC Observatory
- 10:30 AM - 10:50 AM Coffee break
- 10:50 AM - 11:10 AM Naoko Kurahashi Neilson, University of Wisconsin
Cosmic Neutrinos in IceCube
- 11:10 AM - 11:30 AM Eiji Kido, Institute for Cosmic Ray Research, University of Tokyo
Recent results from the Telescope Array experiment
- 11:30 AM - 11:50 AM Abigail Vieregg, University of Chicago
Radio Detection of Ultra-high Energy Neutrinos
- 11:50 AM - 12:30 PM Break-out Discussion 1
- 12:30 PM - 2:00 PM LUNCH
- CENSUS OF EXTRAGALACTIC SOURCES**
Chair: Ke Fang
- 2:00 PM - 2:20 PM Tessa Vernstrom, University of British Columbia
The Radio Background: Recent estimates from discrete and extended sources
- 2:20 PM - 2:40 PM Brian Lacki, NRAO/IAS
All Radiation Backgrounds from Star-Forming Galaxies
- 2:40 PM - 3:00 PM Brian Fields, University of Illinois
Cosmic Rays and the Star-Forming Contribution to the GeV Background
- 3:00 PM - 3:20 PM Marco Ajello, Clemson University
Contribution of Blazars and other source classes to the gamma-ray background
- 3:20 PM - 3:40 PM Coffee break
- 3:40 PM - 4:00 PM Mattia Di Mauro, University of Turin and INFN Turin
Composition of the Isotropic diffuse gamma-ray background and dark matter constraints.
- 4:00 PM - 4:20 PM Vahe Petrosian, Stanford University (Physics and KIPAC)
On The Contribution of Discrete Sources to the Background Radiations
- 4:20 PM - 5:00 PM Break-out Discussion 2
- 5:00 PM - 6:30 PM Welcome Reception

Tuesday - June 10, 2014

- 9:00 AM - 9:10 AM Welcome
- ANISOTROPIES**
Chair: Abigail Vieregg
- 9:10 AM - 9:30 AM Kevork N Abazajian, University of California, Irvine
Constraints and Signals from the Diffuse Gamma Ray and X-ray Backgrounds
- 9:30 AM - 9:50 AM Hajime Takami, KEK
Arrival distribution of ultra-high-energy cosmic rays and implications to their sources
- 9:50 AM - 10:10 AM Foteini Oikonomou, Pennsylvania State University
Anisotropies in the arrival directions of ultra-high energy cosmic rays: current status and prospects with a next-generation instrument
- 10:10 AM - 10:30 AM Sheldon S Campbell, Ohio State University
Combined Energy Spectra of Flux and Anisotropy: Identifying Anisotropic Source Populations of Gamma-rays or Neutrinos
- 10:30 AM - 10:50 AM Coffee break
- 10:50 AM - 11:10 AM Fiorenza Donato, Torino University
Anisotropies in gamma-rays
- 11:10 AM - 11:30 AM Jennifer Siegal-Gaskins, Caltech
Constraining the origin of the gamma-ray background with anisotropy
- 11:30 AM - 11:50 AM Nicolao Fornengo, University of Torino and INFN
Particle dark matter searches in the anisotropic sky
- 11:50 AM - 12:30 PM Break-out Discussion 3
- 12:30 PM - 2:00 PM Lunch
- EBL ATTENUATION, SECONDARY CASCADES, & DARK MATTER**
Chair: Keith Bechtol
- 2:00 PM - 2:20 PM Yoshiyuki Inoue, ISAS/JAXA
Does the near-infrared extragalactic background light excess come from the extragalactic sky?
- 2:20 PM - 2:40 PM Dimitrios Giannios, Purdue
The fate of TeV photons from blazars
- 2:40 PM - 3:00 PM Tonia M Venters, NASA GSFC
The Impact of Electromagnetic Cascades of Energetic Particles on the Extragalactic Gamma-ray Background
- 3:00 PM - 3:20 PM Alberto Dominguez, University of California, Riverside
The measurement of the expansion rate of the Universe from gamma-ray attenuation
- 3:20 PM - 3:40 PM Coffee Break
- 3:40 PM - 4:00 PM Miguel A Sánchez-Conde, KIPAC/SLAC, Stanford
Cosmological dark matter annihilation signals: theoretical predictions
- 4:00 PM - 4:20 PM Gabrijela Zaharijas, ICTP and INFN, Trieste
Cosmological dark matter annihilation signals: experimental constraints
- 4:20 PM - 5:00 PM Break-out Discussion 4

Wednesday - June 11, 2014

- 9:00 AM - 9:10 AM Welcome
- MULTIWAVELENGTH & MULTIMESSENGER CONNECTIONS**
Chair: Dan Hooper
- 9:10 AM - 9:30 AM Kohta Murase, Institute for Advanced Study
Multimessenger Approaches to the Origin of IceCube Neutrinos
- 9:30 AM - 9:50 AM Maria Petropoulou, Purdue University
The role of hadronic cascades in GRB models of efficient neutrino production
- 9:50 AM - 10:10 AM Ke Fang, Kavli Institute for Cosmological Physics
The TA Cosmic Ray Excess and High Energy Neutrinos
- 10:10 AM - 10:30 AM Markus Ahlers, WIPAC
High-Energy Cosmogenic Neutrinos
- 10:30 AM - 10:50 AM Coffee Break
- 10:50 AM - 11:10 AM Amy Connolly, Ohio State University
The Complementarity Neutrinos and Cosmic Rays for UHE Astrophysics
- 11:10 AM - 11:30 AM Kumiko Kotera, Institut d'Astrophysique de Paris
Synchrotron pair echo/halo from ultrahigh energy cosmic rays: a robust scenario to explain extreme TeV blazar observations
- 11:30 AM - 11:50 AM Charles D. Dermer, Naval Research Laboratory
Origin and Impact of Radiation Backgrounds on Detection of High-Energy Radiation Sources
- EXPERIMENTAL AND THEORETICAL OUTLOOK DISCUSSION**
Chairs: Angela Olinto and Tim Linden
- 11:50 AM - 12:30 PM Brainstorming and Discussion (Full Group)
- 12:30 PM - 2:00 PM Lunch (The End)