

# CIPANP 2006

## CIPANP 2006 PHYSICS PROGRAM

The parallel session conveners will put together sessions on the topics listed below. A call for individual abstracts will be made in January 2006. Large collaborations should plan to work directly with the conveners to help in the placement and selection of talks among the sessions (see below for suggestions).

Ten major parallel sessions will be offered. Expected physics sorting is suggested for each major category, and an incomplete list of examples is given.

### 1) Fundamental Symmetries and CKM

P, CP, T, CPT symmetries in atomic, nuclear and particle physics, CKM results

Examples : CLEO, BaBar, Belle-related results; Tevatron B-physics program; EDMs (atomic, other);  $n$  beta decay, lifetime; new  $V_{ud}$ ,  $V_{us}$  measurements; new  $G_F$  measurement, antihydrogen results, time variations of fundamental coupling constants

### 2) Neutrino Masses and Mixings

Neutrino oscillations, double-beta decays, direct neutrino mass measurements

Examples : SNO, KamLand, MiniBooNe, MiNos, K2K, new efforts on  $\Theta_{13}$ , neutrinoless  $\beta\beta$ , n-stars; possibility of strange condensate or quark matter; limits on neutrino masses from CMB and gravitational microlensing

### 3) Nuclear and Particle Astrophysics

Ultra-high energy cosmic rays, dark matter/energy, big-bang nucleosynthesis, cosmology, supernovae, neutron stars

Examples: Icecube, Pierre Auger, AKASA, HighRes, CDMS, SNAP, theory

### 4) Electroweak Physics and Physics Beyond the Standard Model

Direct searches for Higgs, SUSY, extra dimensions;  $W\gamma$ ,  $Z\gamma$ ; single top production, rare decays including  $B \rightarrow \mu\mu$ ; top mass, low-energy precision measurements

**Examples** : Collider results from FNAL, SLAC Møller,  $\mu \rightarrow e\gamma$ ,  $Q_{\text{weak}}$ , new  $g-2$  experiment, other tests, plans and sensitivities at LHC

### 5) Hadron Spectroscopy and Exotics

Light-quark meson and baryon spectroscopy;  $b/c$  production, spectroscopy and decays; hybrids, glueballs, pentaquarks; other exotic or unclassified states; models

**Examples** : Strange-quark spectroscopy, hyperons; heavy-quark hyperons, mesons, HQ theory, lattice predictions; results from CLEO, BaBar, Belle, Tevatron experiments; lattice QCD calculations

### 6) Quark Matter and Heavy Ion Collisions

Global observables, flows, hard probes, correlations, hydrodynamics, and other results from relativistic heavy ion collisions

**Examples** : mostly RHIC results here + lattice calculations + other theoretical interpretations; plans and sensitivities for LHC HI program

### 7) Nucleon Structures

Nucleon form factors, spin physics, unpolarized and polarized parton distributions, generalized parton distributions, large- and small- $x$  physics, calculations from lattice, pQCD, hard scattering, total and differential cross sections

**Examples** : Data from: G0, HERMES, JLab, DESY. Future plans: Drell-Yan, others

### 8) Low-Energy Hadron Physics

Nucleon resonances, hypernuclear physics, nuclear structure, hadronic interactions, effective field theories

**Examples** : JLab experiments on  $N^*$ , hypernuclei, etc.; Mainz, COSY, Spring-8, BNL, JPARC plans, quark-level view of nuclear physics; nuclear structure functions; change of hadron properties in-medium

### 9) High-Energy Hadron Physics

Differential and total cross sections, jets, Drell-Yan process, prompt photons, angular distributions, polarizations

**Examples**: Results from the Tevatron, DESY, KEK, JLAB, BNL; production dynamics of heavy quarks and other systems; calculations in perturbative QCD; plans for future work at JPARC and the LHC

## 10) New Facilities and Instrumentation

New facilities, facility upgrades, new major detectors, new measurement techniques

Examples : JLab Upgrade, RHIC-II, GSI, JPARC, LHC, ILC, eRHIC, proton driver