

NDM12 The 4th International Symposium on Neutrinos and Dark Matter in Nuclear Physics

June 11 th — June 15 th, 2012
Nara, Japan,

Opening H. Ejiri NDM12 chair



Toudaiji HP

Welcome all of you to NDM Nara,

~80 distinguished physicists in ν DM,

many from foreign countries far from Nara.

Nara the 1st capital city 710-794

Origin of Japanese sprits and cultures.

NDM in Toudaiji campas, The biggest temple

The new culture
center built in 2011

The new conference
Kinshou hall



- **Neutrinos and DM in Nuclear Physics**
 1. **Neutrinos and DM are fundamental elements of universe , and key particles in particle, nuclear and astro physics, and also in various scales of cosmic structure formation.**
 2. **They are studied in nuclei and their interactions with nuclei are crucial for particle and astro nuclear physics and cosmology .**
 3. **NDM12 aims at discussing current cross-disciplinary questions and perspectives on ν and DM by bringing together researchers from particle & astro-nuclear physics and astronomy.**

Interplay of particle, nuclear and astro physics in nuclei

Neutrino-less $\beta\beta$ decays

$0\nu\beta\beta$ $A = B + \beta + \beta$
Lepton number $\Delta L=2$ beyond SM.

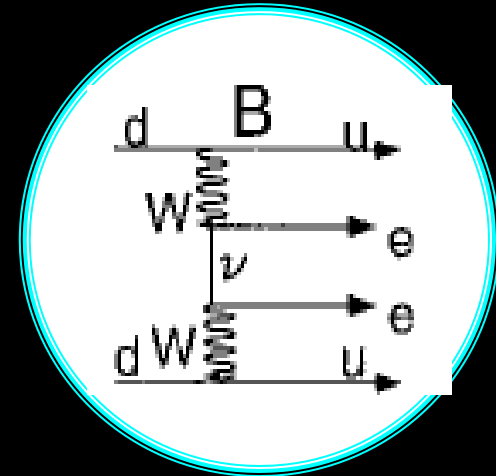
Particle physics
Majorana ν , m_ν CP

$$T^{0\nu} = G^{0\nu} [M^{0\nu} m_\nu]^2$$

Nucl. physics. g_A
nuclear medium &
 τ σ correlations

Cosmology
DM
Leptogenesis

Femto (fm) Lab.



Enhance
 ν -exchange

$$L_N = 10^{48}/\text{cm}^2/\text{s}$$

$$1\text{-ton } L = 6 \cdot 10^{75}/\text{cm}^2/\text{s}$$

$$\sigma \sim 10^{-83}\text{cm}^2 \text{ IH}$$

NDM03

June 2003

Nara

**H. E
Osaka RCNP**

YS1 The 1st Yamada Symposium **NDM 03**
on
**Neutrinos and Dark Matter
in Nuclear Physics**
— June 9 -14, 2003, Nara Japan —
<http://ndm03.phys.sc.osaka-u.ac.jp/>
- Yamada Science Foundation, Director General & YS President, Yasusada Yamada -

**International
Advisors**

Frank Aulignone
South Carolina
Alexander Barabseh
ITEP
Oswaldo Caldeira
La Plata
Armand Faessler
Tubingen
Miroslav Finger
Prague
Ettore Fiorini
Milano
Stuart Freedman
LBNL, Berkeley
Akmal Halim
Queen's SNO
Wick Haxton
UW Seattle
Philippe Hubert
Bordeaux
B. K. Jain
Mumbai/Kolkata
Chung W. Kim
KIAS Seoul
Til Kirsten
MPI Heidelberg
Jin Li
IHEP Beijing
Shih-Chang Lee
Academia Sinica Taiwan
Angel Morales
Zaragoza
Kazuhiko Nishijima
Tokyo
R.G. Hamish Robertson
UW Seattle
Katsuhiko Satoh

**Organizing
Committee**

**Symposium Chair
of NDM03**
Hiro Ejiri
JASRI Spring8/RCNP
Osaka Univ.

**Scientific secretary
of NDM03**
Izumi Ogawa
Dept. Phys.
Osaka Univ.

Ken-ichi Fushimi
Tokushima
Takahisa Itahashi
RCNP
Tadafumi Kishimoto
Osaka
Akira Maseike
Nara
Hisakazu Minakata
TMU
Masaharu Nomachi
Osaka
Hideaki Ohsumi
Saga
Yasuki Naoai

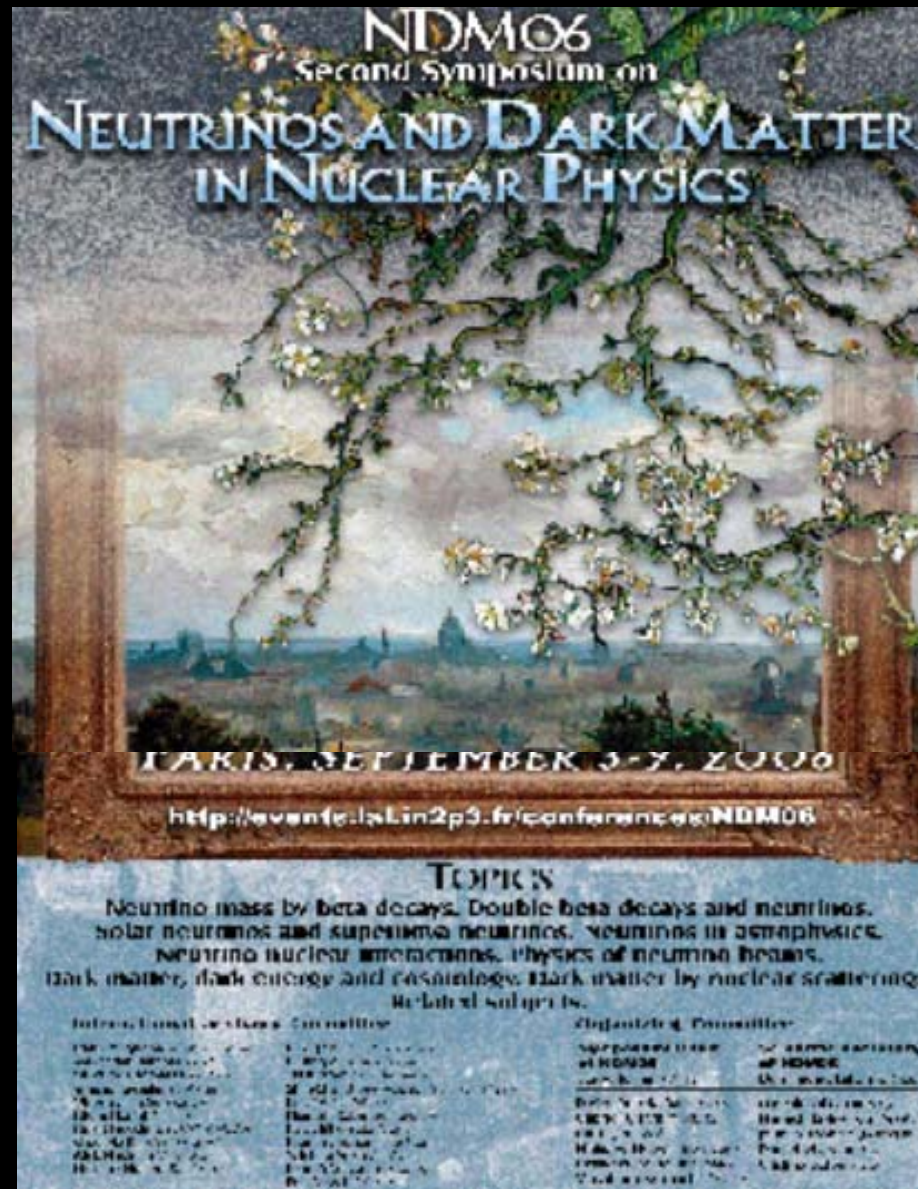
Subjects
Neutrino mass by beta decays.
Double beta decays and neutrinos.
Solar neutrinos and supernova neutrinos.
Neutrinos in astrophysics.
Neutrino nuclear interactions.



NDM06

Sept. 2006
Paris

Serge Jullian
Dominique Lalanne
Orsay



NDM09

Aug -Sep 2009

Madison

Baha Balantekin
Kasten Heeger



**NEUTRINOS
& DARK MATTER 2009**

**MADISON, WISCONSIN
AUGUST 31 - SEPTEMBER 4, 2009**

- Scientific Topics
- Registration
- Abstract Submission
- Transportation
- Lodging
- Program and Talks
- Participants

Welcome to Madison!

The NDM09 Conference will be held in Madison, Wisconsin from

August 31 - September 4, 2009

2012 Nara

NDM12 The 4th International Symposium on Neutrinos and Dark Matter in Nuclear Physics

June 11th — Friday June 15th, 2012.

Kinshou Hall in Todai-Temple campus, Nara, Japan.

- A. Solar, supernova and astrophysical neutrinos and their interactions with nuclei and nucleosynthesis.
- B. Neutrinos in β and $\beta\beta$ decays and nuclear matrix elements
- C. Nuclear reactions and scatterings, and photon and lepton probes for nuclear weak/neutrino responses
- D. Cosmological neutrinos and cosmic large scale structure
- E. Dark matter search and dark matter interactions with nuclei
- F. Dark matter and structure formation.
- G. Related subjects



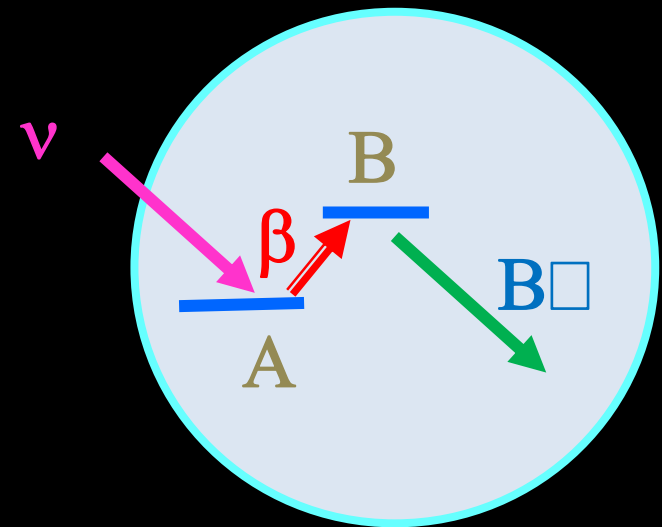
NDM12 Chairs Ejiri H(RCNP) and Kajimo T (NAOJ).

ejiri@rcnp.osaka-u.ac.jp kajimo@nao.ac.jp

Local Organizing Committee Aoki W (NAOJ), Fushimi K (Tokushima,
Scientific Secretary), Hazama R (Hiroshima), Inoue K (Tohoku), Orito R
(Tokushima), Shima T (RCNP), Suzuki T (Tokyo).

<http://archimedes.tokushima-nu.ac.jp/~hazama/nao12DM12-2DM12-3.html>

**Please enjoy
physics discussions
of ν /DM in NDM**



**Cultures of Nara
in the excursion and
in the evening**



Excursion

Thu. 14th 2 pm – 6 pm

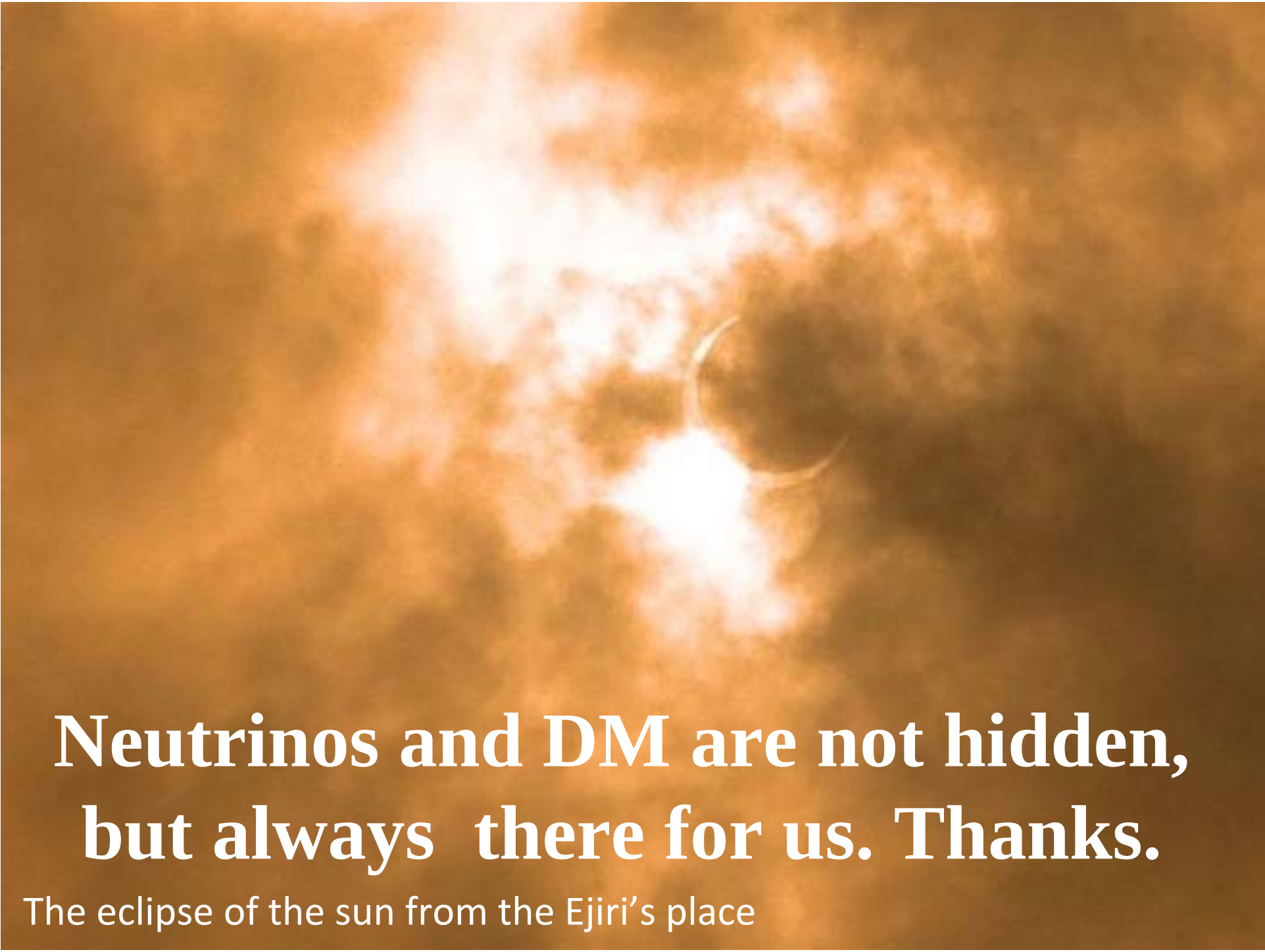
Todai Temple Museum

Daibutsu den , the biggest wooden building, Buddha , the biggest bronze stature, ever emitting v/χ



Thanks for Support

- **National Astronomy Observatory**
 - **Osaka University RCNP**
- **Tokusima University AIS (Ms Ohara)**
 - **Nara Prefecture**
- **Nara Visitor Bureaux (Mr Uea)**
 - **Nara volunteer lady's group**



**Neutrinos and DM are not hidden,
but always there for us. Thanks.**

The eclipse of the sun from the Ejiri's place