

Grant-in-Aid for Scientific Research on Innovative Areas
“Research on the Emergence of Hierarchical Structure of Matter
by Bridging Particle, Nuclear and Astrophysics in Computational Science”

Quarks to Universe in Computational Science (QUCS2012)

Sinya AOKI
University of Tsukuba

Symposium “Quarks to Universe in Computational Science
(QUCS2012)”,
December 13-16, 2012, Nara, Japan

Our project

Grant-in-Aid for Scientific Research on Innovative Areas:

A new Grant from MEXT, which started at 2008.

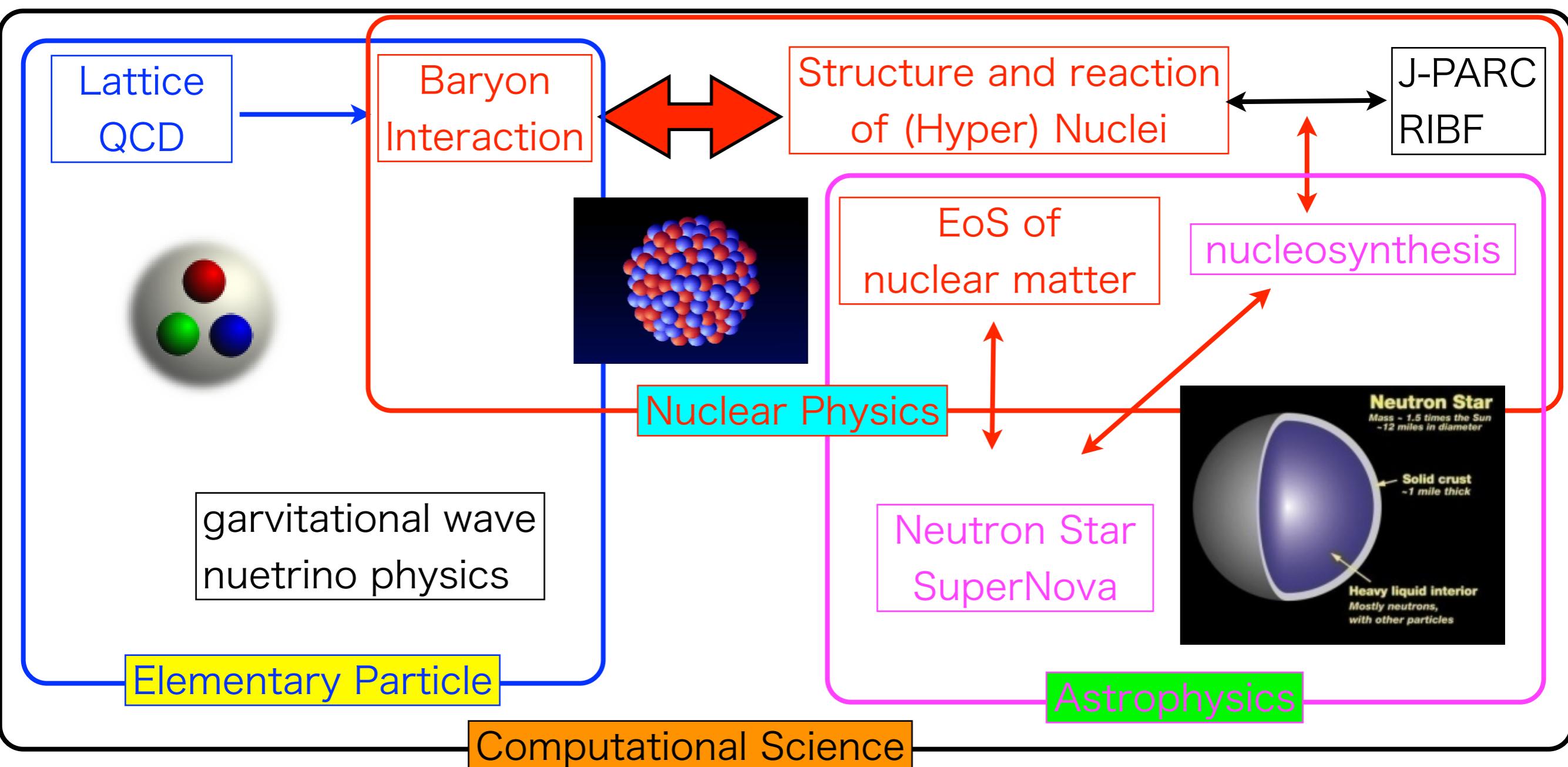
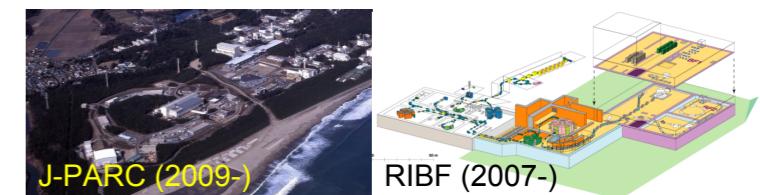
MEXT=Ministry of Education, Culture, Sports, Science and Technology

“Research on the Emergence of Hierarchical Structure of Matter
by Bridging Particle, Nuclear and Astrophysics in Computational Science”

- Collaboration among particle-, nuclear- and astro- physics
- via Computational physics
- 5 years Project (2008.12-2013.3).
- O(\$1.2M)/Year-> O(€1.2M)/Year
- 4 planed research groups + 1 central committee
- O(20x2) proposed personal researches:
 - 2 years x twice(2009-2010/2011-2012), O(€15K)/year
 - workshop, symposium, school, lecture

Purpose of the Project and Research Plans

To construct a new research area where researchers in particle, nuclear and astrophysics work coherently to investigate the hierarchical structure of matter from quarks and nuclei to supernova explosions and nucleosynthesis via computational science.



Research Organization

Central committee

Leader: Sinya Aoki (University of Tsukuba)

Planned research groups

A01 「Vacuum structure and **quark dynamics** in QCD」

Leader: Tetsuya Onogi (Osaka University)

projects

proposals

A02 「**Nuclei Structure** from **quark dynamics**」

Leader: Testuo Hatsuda (University of Tokyo->Riken)

projects

proposals

A03 「Supernova explosion and nucleosynthesis

via **quark dynamics** and **nuclei structure**」

Leader: Hideyuki Suzuki (Tokyo University of Science)

projects

proposals

A04 「Interdisciplinary algorithm and computer simulations」

Leader: Hideo Matsufuru (KEK)

projects

proposals

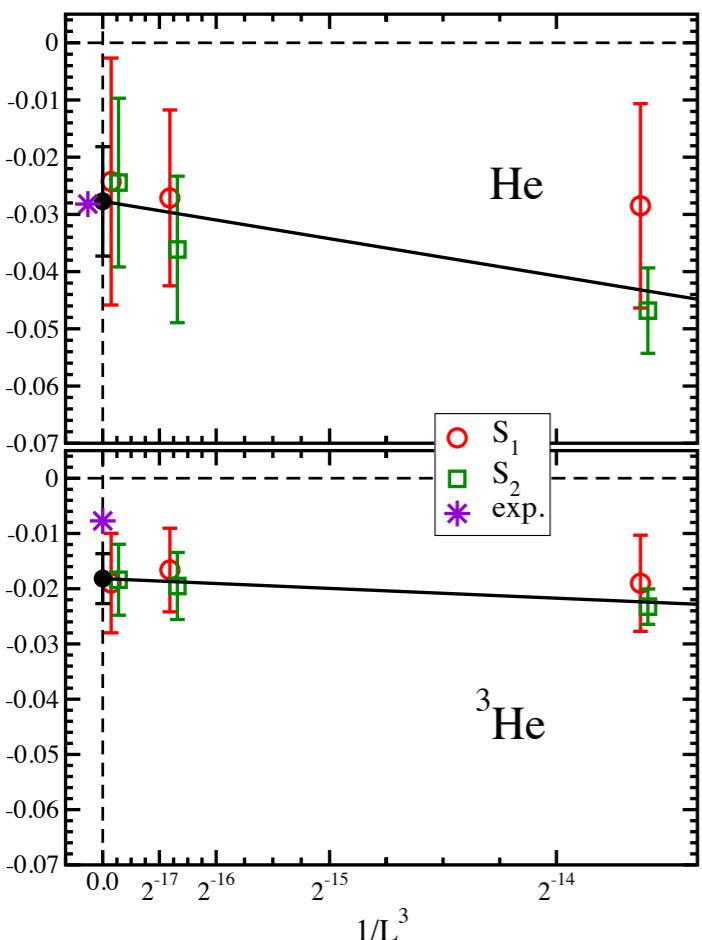
Activities (2008.12-2012.12)

Planned Researches

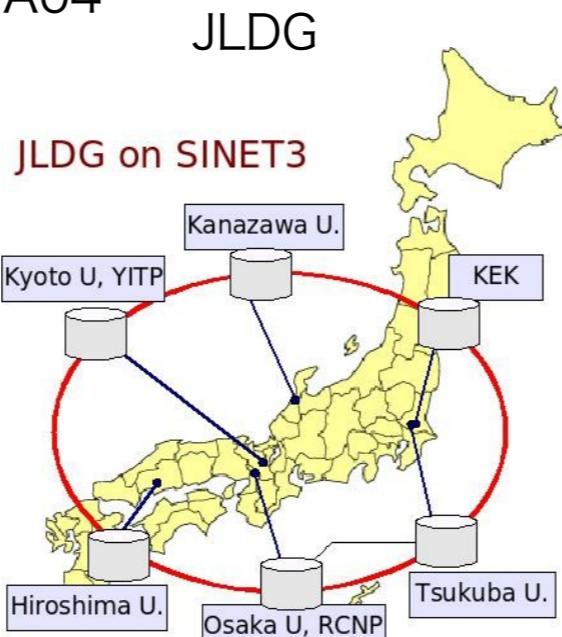
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11:10-11:35	H. Suzuki (Tokyo Sci.)	Astrophysics project (A03) report
11:35-12:00	H. Matsufuru (KEK)	Computational physics project (A04) report

A01

He from lattice QCD

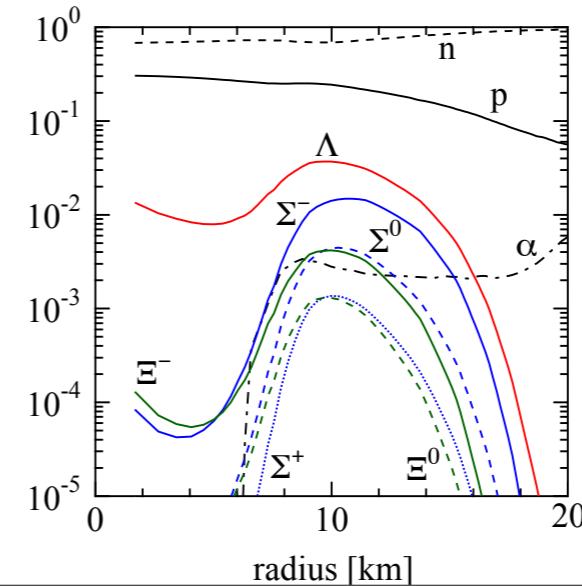


A04



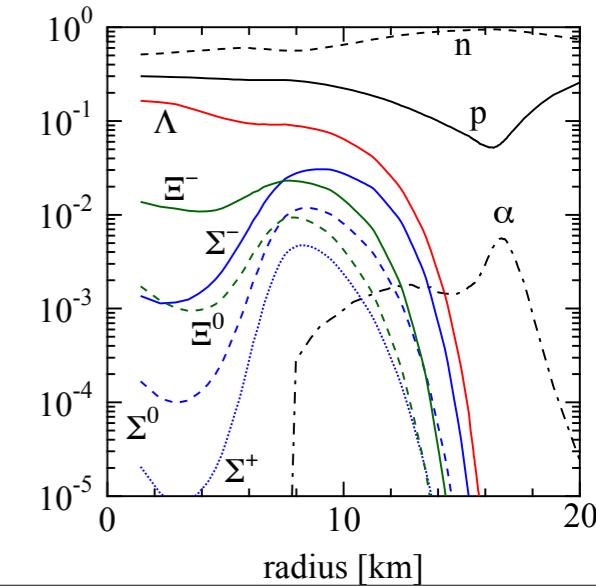
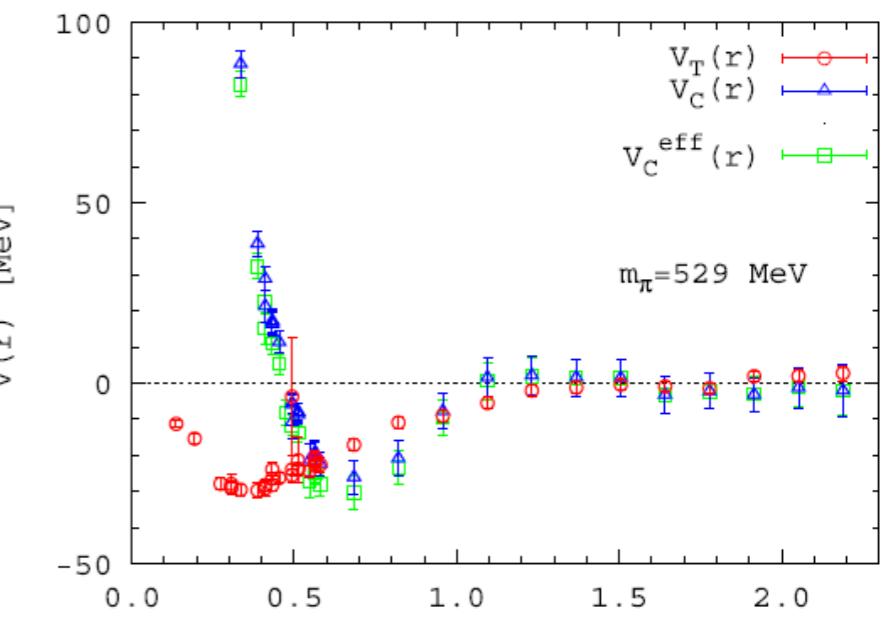
A03

Baryon EoS



A02

NN potential from lattice QCD



Proposed Personal Researches (2009-2010)

- T. Yamazaki “Lattice QCD and light nuclei”
- Y. Kikukawa “Electroweak theory on the lattice”
- K. Sasaki “K- π interaction in lattice QCD”
- E. Shintani “Muon anomalous magnetic moment in lattice QCD”
- S. Sasaki “Charmonium Nuclei”
- T. Abe “Monte-Carlo no-core shell model for light nuclei”
- M. Matsuo “Light and neutrino nuclei reactions in the continuum region”
- M. Takano “Variational calculation of EoS for nuclear matter at T=0”
- K. Hashimoto “Nuclear force and superstring theory”
- H. Nemura “Hyperon interactions in lattice QCD and light hyper-nuclei”
- S. Nagataki “Gamma ray burst”
- Y. Sekiguchi “Numerical relativity for binary neutron star merger”
- N. Yasutake “QCD phase transition for the evolution of neutron”
- T. Sakurai “Linear algebra for particle, nuclear and astrophysics”
- T. Ishikawa “Special purpose machine for higher order corrections”

Proposed Personal Researches (2011-2012)

- Y. Taniguchi “QED corrections in lattice QCD”
- S. Ejiri “EoS in lattice QCD at finite density”
- S. Takeda “Phase structure in lattice QCD”
- T. Yamazaki “Light nuclei in lattice QCD”
- H. Fukaya “Qualitative estimate for observables in chiral symmetry breaking”
- H. Iida “Interaction between massive quarks in lattice QCD”
- E. Shintani “Neutron electric dipole moment in lattice QCD”
- T. Izubuchi “Lattice QCD simulations in chiral quarks”
- S. Sasaki “Hyperon beta decay in lattice QCD”
- K. Hashimoto "Holography and nuclear force"
- A. Umeya “Neutron-rich large hypernuclei in shell model with tensor force”
- T. Hanawa “Magnetic hydrodynamics wave in supernova explosion”
- K. Nomoto “R-process nucleosynthesis in supernova explosion ”
- H. Sotani “Internal structure of neutron star from gravitational waves”
- T. Maruyama “Pasta structure of nuclei”
- T. Sakurai “Linear algebra for particle, nuclear and astrophysics”

Collaboration between different groups

- A01-A02
 - Nuclear physics in lattice QCD
- A02-A03
 - EoS in neutron star/nuclear matter
- A01-A04
 - Improvement of algorithm & efficiency
 - Data Grid
 - Development and maintenance of QCD code
- A03-A04
 - Code for supernova explosion
 - parallelization, linear solver
 - neutrino radiation & transport in 3-dim.

Symposium, Workshop, Lecture, School, etc.

Annual Symposium/Workshop

bottle gifted by
Matsufuru-san



2008.12.1-2 Startup workshop@Tsukuba

“Bridging Particle, Nuclear and Astrophysics
in Computational Science”

2010.3.15-16 Joint Symposium@Tokyo

“Origin of matter and universe”

2010.11.28-30 International Symposium@Atagawa(hot spring)

“From Quarks to Supernovae”



2011.12.3-5 Workshop@Shima

“Progress on Bridging Particle, Nuclear and Astrophysics
in Computational Science”

2012.12.13-16 Summary Symposium@Nara

“Quarks to Universe in Computational Science (QUCS2012)”

Other Symposia/Workshops

JICFuS=Joint Institute for Computational Fundamental Science

2009.2.23 JICFuS symposium@Tsukuba “Future of fundamental science
in large scale simulations”

2011.6.23-24 Crossover workshop with ‘New hadron’ @Kobe
“Challenge in hadron physics”

2012.7.12-13 Crossover workshop with ‘New hadron’ @Nagoya
“New hadrons in various flavors”



Summer School @Kyoto(organized by Hiyama)
“From quarks to supernovae”

2011.8.4-11 1st



2012.7.27-31 2nd

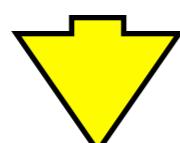
about 30 participants
(Student, young PD)



Lattice QCD simulations for nuclear force



Few body calculation for He binding energy



EoS calculation and simulation for supernova explosion



Lecture Series for non-experts (organized by Aoki)

1. 2010.6.9-10@Tokyo M. Shibata “Numerical relativity”
2. 2010.12.15-16@Kyoto S. Aoki “Lattice QCD and numerical simulations”
3. 2011.6.8-9@Tokyo K. Kotake “High energy astrophysics”
4. 2012.1.11-12@Kyoto T. Abe “Nuclei shell model”
5. 2012.2.27-28@Riken Y. Funaki “Nuclei cluster model”
6. 2012.6.18-19@Tsukuba M. Hanada “Monte Carlo approach to String/M theory”
7. 2011.11.8-9@Kobe T. Okamoto “Galaxy formation and dark matter”



Awards

2009.2 25th Inoue prize for science, **S. Aoki**

2010.1 6th JSPS prize, **M. Shibata** JSPS= Japan Society for the Promotion of Science

2010.3 4th Young scientist awards of JPS, **T. Yamazaki, Y. Ikeda**

JPS= The Physical Society of Japan

2011.3 5th Young scientist awards of JPS, **T. Abe**

2012.3 17th JPS awards for academic paper on physics, **S.Aoki-T.Hatsuda-N.Ishii**

2012.10 23th Tsukuba prize, **S.Aoki-T.Hatsuda-N.Ishii**

2012.12 2012 Nishina memorial prize, **S.Aoki-T.Hatsuda-N.Ishii**

SPIRE(Strategic Program for Innovative Research) Field 5 “Origin of matter and the universe”

SPIRE: MEXT's program to promote scientific and engineering applications of K computer.
(FY2011-15)

Field 1	Predictive life sciences, medical care and drug design	RIKEN
Field 2	New material and energy creation	Institute of Solid State Physics, Univ. of Tokyo
Field 3	Global change prediction for disaster prevention and reduction	JAMSTEC
Field 4	Industrial Innovation	Institute of Industrial Science, Univ. of Tokyo
Field 5	Origin of matter and the universe	RCCS, Univ. of Tsukuba

Project-1. Lattice QCD

Project-2. Nucleus

Project-3. Supernova Explosion

Project-4. Early Star Formation



Our project is playing a major role in field 5.



O(10)Peta Flops supercomputer
available from fall in 2012

$10^{16} = 10$ Peta



FUJITSU

RIKEN
Fujitsu Limited
November 14, 2011



Top 500

Rank	Computer	vendor	country	LINPACK(PFlops)	PEAK(PFlops)
1	K computer	Fujitsu	Japan	8.162	8.774
2	Tianhe-1A	NUDT	China	2.566	4.701
3	Jaguar	Cray	USA	1.759	2.331

2011.11

1	K computer	Fujitsu	Japan	10.510	11.280
2	Tianhe-1A	NUDT	China	2.566	4.701
3	Jaguar	Cray	USA	1.759	2.331

2012.6

1	Sequoia	IBM	USA	16.325	20.133
2	K computer	Fujitsu	Japan	10.510	11.280
3	Mira	IBM	USA	8.162	10.066

2012.11

1	Titan	CRAY	USA	17.590	27.113
2	Sequoia	IBM	USA	16.325	20.133
3	K computer	Fujitsu	Japan	10.510	11.280

Future

- summarize activities of the project in this symposium.
- no succeeding proposal to this project in [Grant-in-Aid for Scientific Research on Innovative Areas](#), but
- a large part of activities will run under the Field-5 of SPIRE from 2013.
 - [3 research projects](#) +1 new project
 - Summer School, Lecture Series
 - Support, QCD common code(Bridge++)
- Our sprits for interdisciplinary collaborations will remain important for the success of Field-5.

Symposium program

Thursday, December 13

09:00-10:00	Registration	
10:00-12:00	Session I	Chair: S. Aoki (Tsukuba)
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10:20-10:45	T. Oonogi (Osaka)	Particle physics project (A01) report
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11:10-11:35	H. Suzuki (Tokyo Sci.)	Astrophysics project (A03) report
11:35-12:00	H. Matsufuru (KEK)	Computational physics project (A04) report
12:00-13:30	Lunch	
13:30-16:00	Session II	Chair: T. Hatsuda (RIKEN)
13:30-14:20	T. Janka (MPA)	Core-collapse supernovae
14:20-14:50	Y. Sekiguchi (YITP)	Numerical Relativity Simulations of NS-NS binary merger
14:50-15:40	T. Kennedy (Edinburgh)	Progress of algorithms in lattice gauge simulations
15:40-16:00	K. Ishikawa (Hirosima)	Testing SSOR preconditioner for Domainwall/Overlap normal equations
16:00-16:30	Break	
16:30-18:20	Session III	Chair: H. Suzuki (Tokyo Sci.)
16:30-17:00	M. Hayakawa (Nagoya)	Numerical approach to QED contribution in the lepton g-2
17:00-17:20	H. Fukaya (Osaka)	Pion form factors in the epsilon regime
17:20-17:40	K. Sato (RIKEN)	Mean-field calculation including proton-neutron mixing in atomic nuclei --toward proton-neutron pairing--
17:40-18:00	T. Yoshida (Tokyo)	Current Status of Massive Star Evolution
18:00-18:20	K. Kiuchi (YITP)	Black hole-neutron star merger with neutrino cooling
18:30-20:30	Poster Session	

Friday, December 14

09:00-10:30	Session IV	Chair: S. Hashimoto (KEK)
09:00-09:50	Z. Fodor (Wuppertal)	Computational particle physics
09:50-10:30	Y. Akiba (RIKEN)	Quark-Gluon Plasma
10:30-11:00	Break	
11:00-12:30	Session V	Chair: T. Nakatsukasa (RIKEN)
11:00-11:50	J. Carlson (LANL)	Computational nuclear physics
11:50-12:30	H. Sakurai (RIKEN/Tokyo)	Nuclear physics at RIBF
12:30-14:00	Lunch	
14:00-16:00	Session VI	Chair: E. Hiyama (RIKEN)
14:00-14:40	H. Tamura (Tohoku)	Strangeness nuclear physics
14:40-15:10	T. Abe (Tokyo)	No-core Monte Carlo shell model towards ab initio nuclear structure
15:10-15:40	T. Doi (RIKEN)	Hadron interactions on the lattice
15:40-16:00	H. Togashi (Waseda)	Variational Study of a Nuclear Equation of State for Core-Collapse Supernovae
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16:30-16:50	G. Cossu (KEK)	Finite temperature study of axial symmetry on the lattice
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17:10-17:30	S. Ejiri (Niigata)	Study of finite density lattice QCD by the histogram method
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19:30-	Banquet	

A03(Invited)

A03

A04(Invited)

A04

A01 A01

A02

A03

A01(Invited)

Exp

A02(Invited)

Exp

A02

A02

A03

A01

A02

A01

A02

A03

Symposium program

Symposium program

Poster Program

A01-P1	X. Feng (KEK)	Time-like pion form factor in lattice QCD
A01-P2	Y. Aoki (KMI, Nagoya Univ.)	Exploring for Walking Technicolor from QCD -Towards the Composite Higgs Model-
A01-P3	K. Kanaya (Univ. of Tsukuba)	Quark matter at high temperatures and low densities on the lattice
A01-P4	T. Kaneko (KEK)	Precision determination of the CKM matrix element $ V_{us} $
A01-P5	Y.-G. Cho (Univ. of Tsukuba)	$O(a^2)$ -improved lattice fermions with exact chiral symmetry
A01-P6	Y. Nakagawa (Niigata Univ.)	Lattice study of the phase structure in finite density QCD with a histogram method
A01-P7	M. Hanada (KEK)	Numerical Approach to Supersymmetric Gauge Theories and String/M-theory
A01-P8	S. Furui (Teikyo Univ.)	Dark matter and the triality symmetry of leptons and quarks
A02-P9	B. Charron (Univ. of Tokyo)	Pion-pion interaction from lattice QCD
A02-P10	Y. Ikeda (RIKEN)	LQCD study of pi-Sigma and KN interactions
A02-P11	N. Ishii (CCS, Univ. of Tsukuba)	2+1 flavor QCD result of nuclear forces
A02-P12	F. Uchiyama (KEK)	Extreme neutron rich nuclei in the beginning of formation of matter in universe
A02-P13	S. Ohnishi (Tokyo Tech. /RIKEN)	Production Reaction of KbarNN-piYN Resonance and KbarN interaction
A02-P14	S. Ozaki (Yonsei Univ.)	Lattice study of low energy charmonium-hadron scattering
A02-P15	K. Sasaki (CCS, Univ. of Tsukuba)	Coupled channel approach to S=-2 baryon-baryon system in Lattice QCD
A02-P16	H. Suno (RIKEN)	Application of the Gaussian expansion method to cold atomic few-body systems
A02-P17	H. Toki (RCNP, Osaka Univ.)	Tensor optimized shell model and the role of delta for finite nuclei
A02-P18	H. Nemura (Univ. of Tsukuba)	Study of LambdaNucleon-SigmaNucleon interaction from lattice QCD
A02-P19	K. Fukukawa (RIKEN)	Three-Nucleon Scattering by the Quark-Model Baryon-Baryon Interaction fss2
A02-P20	K. Horii (RCNP, Osaka Univ.)	Tensor optimized few-body for light nuclei
A02-P21	T. Myo (Osaka Inst. of Technology)	Tensor optimized shell model using bare interaction for light nuclei
A02-P22	K. Murano (RIKEN)	Spin-Orbit force in the NN system from Lattice QCD
A02-P23	M. Yamada (Univ. of Tsukuba)	Omega-Omega interaction on the Lattice
A03-P24	M. Okamoto (Univ. of Tsukuba)	Non-uniform nuclear matter in neutron star crust
A03-P25	H. Sotani (NAOJ)	Possibility to restrict on neutron star matter by using asteroseismology
A03-P26	M. Takano (Waseda Univ.)	Variational Study of Nuclear Matter with an Explicit Energy Functional
A03-P27	K. Takahashi (Univ. of Tokyo)	Core collapse of an O+Ne core
A03-P28	S. Nagataki (YITP, Kyoto Univ.)	Central Engine of Long Gamma-Ray Bursts and Resulting Explosive Nucleosynthesis
A03-P29	K. Nakamura (NAOJ)	Multi-dimensional Simulations of Core-collapse Supernovae
A03-P30	S. Furusawa (Waseda Univ.)	The influence of nuclear statistical equilibrium equation of state on core-collapse supernova simulations of massive stars
A03-P31	K. Hotokezaka (Kyoto Univ.)	Measurement of the equation of state with gravitational wave detectors
A03-P32	K. Masuda (Univ. of Tokyo)	Hadron-Quark Crossover and Massive Hybrid Stars with Strangeness
A03-P33	N. Yasutake (Chiba Tech.)	Non-uniform structures in hadron-quark phase transition with Dyson-Schwinger method

3 best posters will be selected
by the committee.

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A03

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A04

A01 A01

A02

A03

A01(Invited)

Exp

A02(Invited)

Exp

A02

A02

A03

A01

A02

A01

A02

A03

Saturday, December 15

09:00-10:20	Session VIII	Chair: T. Oonogi (Osaka)	
09:00-09:40	K. Makishima (Tokyo/RIKEN)	Physics and Astrophysics of Compact Stars	Exp
09:40-10:20	T. Iijima (Nagoya)	Hadron spectroscopy with a variety of flavors	Exp
10:20-10:50	Break		
10:50-12:20	Session IX	Chair: T. Doi (RIKEN)	
10:50-11:20	T. Yamazaki (Nagoya)	Calculation of light nuclei from lattice QCD	A01
11:20-11:50	K. Nagata (Hirosima)	Finite density lattice QCD at low temperature	A01
11:50-12:20	Y. Suwa (YITP)	Physical Ingredients in Core-Collapse Supernova Explosion Mechanism	A03
12:20-13:50	Lunch		
13:50-15:20	Session X	Chair: K. Sumiyoshi (Numazu)	
13:50-14:20	S.W. Kim (Osaka)	Cosmological solutions in the Lorentzian matrix model	A01
14:20-14:50	S. Motoki (KEK)	Common code system for the lattice QCD simulations	A04
14:50-15:20	A. Imakura (Tsukuba)	A parameter tuning technique of a weighted Jacobi-type preconditioner and its application to supernova simulations	A04
16:00-18:00	Special Session	Chair: S. Aoki (Tsukuba)	
16:00-16:50	T. Maskawa (KMI, Nagoya Univ.)	現代社会と科学	
17:00-17:50	T. Kobayashi (Tokyo)	“ヒッグス粒子”の発見と今後の展望	
18:00-19:30	インフォーマルミーティング (会議室3)	次世代システム調査検討WGとの意見交換会 (参加自由)	

Sunday, December 16

09:00-10:40	Session XI	Chair: S. Ejiri (Niigata)	
09:00-09:30	J. W. Lee (KEK)	Large Nc gauge theory and chiral random matrix theory	A01
09:30-09:50	N. Yamada (KEK)	Exploring many flavor QCD on the lattice	A01
09:50-10:20	M. Kimura (Hokkaido)	Modifying and Probing Nuclear Structure by Λ Particle	A02
10:20-10:40	A. Umeya (NIT)	Lambda Hypernuclei of He isotope with TOSM + UCOM	A02
10:40-11:10	Break		
11:10-12:30	Session XII	Chair: K. Hashimoto (Osaka)	
11:10-11:40	K. Nakazato (Tokyo Sci.)	Stellar Core Collapse and Exotic Matter	A03
11:40-12:10	K. Sumiyoshi (Numazu)	Numerical modeling of core-collapse supernovae with progress in nuclear physics and supercomputing	A03
12:10-12:30	A. Mizuta (KEK)	Jet Opening angle of gamma-ray burst outflows	A03
12:30-14:00	Lunch		
14:00-14:45	Poster Award (3 talks)	Chair: S. Aoki (Tsukuba)	
14:45-14:55	Closing Address		
15:00	Adjourn		

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10:50-11:20	T. Yamazaki (Nagoya)	Calculation of light nuclei from QCD
11:20-11:50	K. Nagata (Hirosima)	Finite density lattice QCD and its application
11:50-12:20	Y. Suwa (YITP)	Physical Ingredients in Computational Science
12:20-13:50	Lunch	
13:50-15:20	Session X	Chair: K. Sumiyoshi (Nagoya)
13:50-14:20	S.W. Kim (Osaka)	Cosmological solutions in the framework of string theory
14:20-14:50	S. Motoki (KEK)	Common code system for the simulation of particle collisions
14:50-15:20	A. Imakura (Tsukuba)	A parameter tuning technique for the numerical application to supernova simulations
16:00-18:00	Special Session	Chair: S. Aoki (Tsukuba)
16:00-16:50	T. Maskawa (KMI, Nagoya Univ.)	現代社会と科学
17:00-17:50	T. Kobayashi (Tokyo)	“ヒッグス粒子”の発見と今後の展望
18:00-19:30	インフォーマルミーティング（会議室3）	次世代システム調査検討会

Sunday, December 16

09:00-10:40	Session XI	Chair: S. Ejiri (Niigata)
09:00-09:30	J. W. Lee (KEK)	Large Nc gauge theory and its applications
09:30-09:50	N. Yamada (KEK)	Exploring many flavor QCD
09:50-10:20	M. Kimura (Hokkaido)	Modifying and Probing Nuclear Physics
10:20-10:40	A. Umeya (NIT)	Lambda Hypernuclei of Heavy-Ions
10:40-11:10	Break	
11:10-12:30	Session XII	Chair: K. Hashimoto (Osaka)
11:10-11:40	K. Nakazato (Tokyo Sci.)	Stellar Core Collapse and its Aftermath
11:40-12:10	K. Sumiyoshi (Numazu)	Numerical modeling of complex systems by supercomputing
12:10-12:30	A. Mizuta (KEK)	Jet Opening angle of gamma rays
12:30-14:00	Lunch	
14:00-14:45	Poster Award (3 talks)	Chair: S. Aoki (Tsukuba)
14:45-14:55	Closing Address	
15:00	Adjourn	

現代社会と科学

市民講演会「クオーケンから宇宙まで」

小林富雄
東京大学素粒子物理国際研究センター 教授

益川敏英
名古屋大学素粒子宇宙起源研究機構長／京都産業大学益川塾塾頭

「ヒッグス粒子」の発見と
今後の展望

2012年
12月15日(土)
16:00～18:00
無料 事前申込み不要

■会場 ■奈良県新公会堂
(近鉄奈良駅から徒歩20分、JR奈良駅からバス停「大仏殿春日大社前」下車徒歩3分)

主催：新学術領域研究「素核宇宙融合による計算科学に基づいた重層的物質構造の解明」、計算基礎科学連携拠点、
HPCI 戦略プログラム分野5「物質と宇宙の起源と構造」、理化学研究所・仁科加速器研究センター
後援：奈良女子大学

本市民講演会は、国際シンポジウムの一環として開催します。
Quarks to Universe in Computational Science
12/13(木)～12/16(日) 奈良県新公会堂

問い合わせ <http://www.jicfus.jp/jp/>
筑波大学計算科学研究センター広報室 029-853-6260

Saturday, December 15

09:00-10:20	Session VIII	Chair: T. Oonogi (Osaka)	
09:00-09:40	K. Makishima (Tokyo/RIKEN)	Physics and Astrophysics of Compact Stars	Exp
09:40-10:20	T. Iijima (Nagoya)	Hadron spectroscopy with a variety of flavors	Exp
10:20-10:50	Break		
10:50-12:20	Session IX	Chair: T. Doi (RIKEN)	
10:50-11:20	T. Yamazaki (Nagoya)	Calculation of light nuclei from lattice QCD	A01
11:20-11:50	K. Nagata (Hirosima)	Finite density lattice QCD at low temperature	A01
11:50-12:20	Y. Suwa (YITP)	Physical Ingredients in Core-Collapse Supernova Explosion Mechanism	A03
12:20-13:50	Lunch		
13:50-15:20	Session X	Chair: K. Sumiyoshi (Numazu)	
13:50-14:20	S.W. Kim (Osaka)	Cosmological solutions in the Lorentzian matrix model	A01
14:20-14:50	S. Motoki (KEK)	Common code system for the lattice QCD simulations	A04
14:50-15:20	A. Imakura (Tsukuba)	A parameter tuning technique of a weighted Jacobi-type preconditioner and its application to supernova simulations	A04
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09:30-09:50	N. Yamada (KEK)	Exploring many flavor QCD on the lattice	A01
09:50-10:20	M. Kimura (Hokkaido)	Modifying and Probing Nuclear Structure by Λ Particle	A02
10:20-10:40	A. Umeya (NIT)	Lambda Hypernuclei of He isotope with TOSM + UCOM	A02
10:40-11:10	Break		
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11:40-12:10	K. Sumiyoshi (Numazu)	Numerical modeling of core-collapse supernovae with progress in nuclear physics and supercomputing	A03
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12:30-14:00	Lunch		
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Enjoy the symposium. Thank you.