



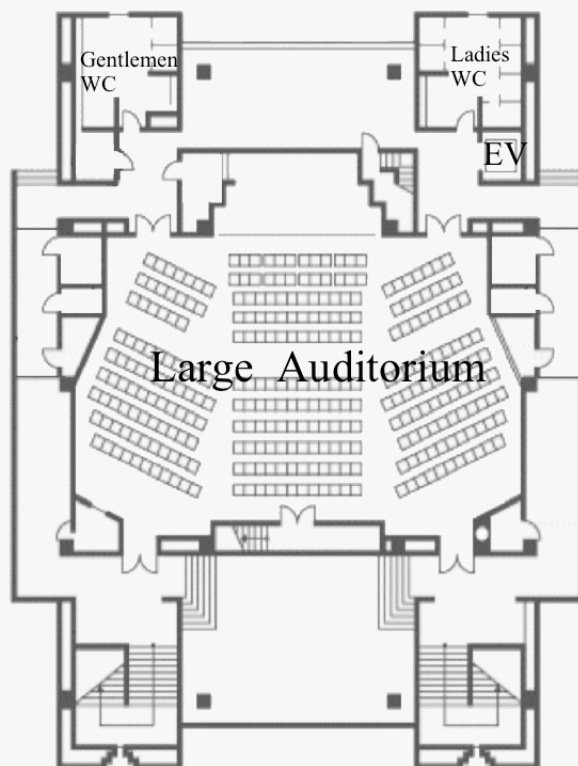
11th International Conference on Quasicrystals (ICQ11)

June 13-18, 2010, Sapporo Japan

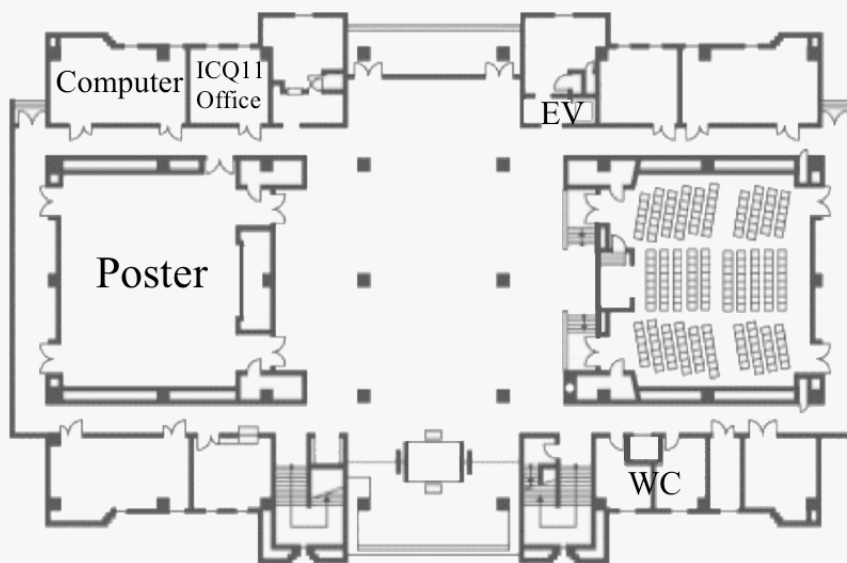
Revised on June 20, 2010



Second Floor



First Floor



Entrance

In case of emergency

From 8:00 to 19:00 a member of conference secretariat can be reached at 706-2141. At other hours, please contact Tsutomu Ishimasa at 762-0102.

本アブストラクト集には再生紙を使用しています。

Revised on June 20, 2010

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Dear Friends,

Welcome to the 11th International Conference on Quasicrystals, ICQ11, in Sapporo!

ICQ11 continues the series of meetings held at Les Houches (1986), Beijing (1987), Vista-Hermosa (1989), St. Louis (1992), Avignon (1995), Tokyo (1997), Stuttgart (1999), Bangalore (2002), Ames (2005), and Zürich (2008).

During the past 25 years, the research field of quasicrystals has grown and expanded in several directions. Structural problems continue to engage crystallographers and mathematicians. The unusual physical properties still pose challenges for experimental and theoretical physicists. New alloy systems including stable binary quasicrystals have been discovered and sample preparation techniques such as single crystal growth have been improved. Material scientists and surface scientists are now trying to establish novel engineering fields. Many complex crystals are now understood in the relation to quasicrystals. In addition, there are two new movements. One is an expansion from alloys to other quasiperiodic substances, for example, ceramics, polymers, and aggregates of nano-particles, etc. The other is artificial generation of quasiperiodic systems such as micro-scale structures controlled by laser fields. We are sure that these new results will stimulate fruitful discussions and give us comprehensive understanding of the nature of quasiperiodicity.

Hokkaido was the new frontier of Japan during the Meiji era. You can still feel a special atmosphere; the frontier spirit, in the campus of Hokkaido University to this day. The university has a long history of the research on crystallography. In 1936, Dr. Ukichiro Nakaya successfully produced the world's first "artificial snowflake crystal". The discovery of the growth mechanism of snowflake crystals brought him the Prize of the Japan Academy, and the university became the center of low-temperature science in Japan. The logo of ICQ11 was designed by Dr. Cesar Pay Gómez to symbolize the past and the future, namely from the snow crystal to the quasicrystal. The famous phrase by Dr. Nakaya is "Snow, a letter from the sky.". One purpose of our conference is to find a proper ending to the phrase "Quasicrystals, a letter from ... ?".

We wish you a pleasant stay in Sapporo.

Tsutomu Ishimasa and Yasushi Ishii
Co-chairs of ICQ11

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General Information

1. Conference hall

The conference hall is located near the main gate of Hokkaido University. The address is Kita-8, Nishi-5. Every morning the conference hall will be open at 8:10.

2. Presentations

Oral Presentations

All lectures will be given in the Large Auditorium on the second floor (see Map) in the Conference Hall.

There are two types of oral presentations. One is an invited lecture and the other is a contributed lecture. The former includes 30 minutes talk plus 10 minutes discussion. The contributed one is limited to 15 minutes plus 5 minutes for discussion.

Both Macintosh (Mac OS X v10.6) and Windows-based PC (Windows XP Professional SP3) are available for presentations. Microsoft Office 2008 and Keynote '09 are available for the former, and Microsoft Office 2007 for the latter. Adobe Reader 9 is available for both types. The presenters may also use their own computers. A visual projector, substitution for an overhead projector, will also be available, but the user needs to ask the operator beforehand.

It is strongly recommended for presenters to check the condition of their slides before the session in order to be assured that everything is displayed correctly.

Poster Presentations

The poster sessions 1, 2 and 3 are scheduled on Monday, June 14 in the large room on the first floor (see Map). The poster sessions 4 ~ 8 are on Tuesday, June 15 in the same room. Each poster can be displayed for the whole time from Monday to Friday. Each poster presenter will be asked to be present at one of the poster sessions indicated by the presentation code.

3. Social Program

Welcome party

On Sunday, June 13, 2010, from 18:00 to 20:00, we invite you to our welcome party at Restaurant "Elm" in the Faculty House "Trillium (Enreiso in Japanese)" on the campus of Hokkaido University. You will walk to the restaurant from the Conference hall, and in the campus you will feel some difference from other Japanese Universities. Actually this area is one of the sightseeing spots in Sapporo.

Conference Excursion

The conference excursion will be on Wednesday, June 16. You will start at 11:20 from the conference hall after receiving a lunch box. You will go by bus (~ 1.5 hours) to "Jigokudani", the Hell valley, located in Noboribetsu. You will see and smell volcanic activities in the hot spring region. (Sorry we have no time to enjoy the hot spring itself, namely "Onsen".) Afterwards you will visit "Poroto Kotan", the Ainu Museum, in Shiraoi to see the traditional Ainu dance. Ainu is an indigenous people who lived in Hokkaido and has original traditions.

You will return to Sapporo in the evening at approximately 18:00.

Conference dinner

The conference dinner will be held in the evening of Thursday, June 17 at the JR Tower Hotel Nikko. (The hotel is actually one part of JR Sapporo station building.) The banquet room is located at the 36th floor in the building. You will have a nice view of Sapporo city. Awarding Ceremony of Jean Marie Dubois Award will be held here.

Accompanying Persons

We have two programs for accompanying persons, namely Kimono-wearing (Tuesday afternoon, June 15) and Sapporo City Walk (Thursday afternoon, June 17). The programs are basically for persons with reservation, but please make contact to the conference office, if you would like to join it, in particular Sapporo City Walk.

4. Computer and Internet

Wireless LAN system (WPA-PSK or WPA2-PSK) is available everywhere in the conference hall. However, you need a guest account for the connection. Please ask the conference office for the account. Few personal computers with internet connection are available in the room indicated in the Map.

5. Restaurants for Lunch

Except for Wednesday June 16, there is no lunch service. A restaurant map will be provided, which includes nearby restaurants. In the campus, two university cafeterias are available; one is "Clark Shokudou (mainly for students)", and the other is "Kyaratei (mainly for staff)". If you permit 5 minutes walk to the downtown, our recommendation is **restaurant area at PASEO in Sapporo Station**, that is located at B1F. (On the opposite side of Yodobashi Camera, just under the overhead railway, you will find the entrance to the restaurant area.) There are many choices from Japanese to European style. Examples of the former are "Jinbei" for Hokkaido specialties, and "Hageten" for Tempura (set menu ~1280 JPY).

If you are not familiar with Japanese restaurants, please follow Japanese attendants and ask their advice.

It may be worthy to know that Sapporo Specialties are classified into four categories.

- (1) Product of northern sea: fresh fishes and sea plants, typically Sushi.
- (2) Sapporo Ramen: hot noodle with tasty soup.
- (3) Soup Curry Rice: this is new trend.
- (4) The last is Sapporo Bear.

Hint: Probably because of the cold and long winter, there are several restaurant areas developed under the ground. Interestingly, you will find restaurant areas also in completely opposite location, namely near the top floor of a building.

6. Conference Office

The registration desk will be open on Sunday, June 13, 2010 from 15:00 to 18:00 in the entrance hall of the Conference Hall. On all other days the office will be open from 8:20.

Tel.: (011)-706-2141 from 8:10 to 18:30

E-mail: icq11@eng.hokudai.ac.jp

7. ICQ11 Young Scientist Awards

Two awards will be made for outstanding presentations/posters of scientists younger than 35 years old. Each ICQ11 Young Scientist Award comes with a cash prize of 30,000 JPY each. The Awards will be presented at the closing on Friday.

8. Jean Marie Dubois Award

As the Award Secretary for the Jean Marie Dubois Award, I am very pleased to announce that the 2010 Award will be given to Dr. *Marc de Boissieu*. The Award will recognize his important, pioneering work on the lattice dynamics, phasons, and atomic structure of quasicrystals.

The Jean Marie Dubois Award was established to recognize important, sustained research on any aspect of quasicrystals within the 10-year period preceding the award. Professor de Boissieu is the third recipient of this award. Past winners are:

Professor An Pang Tsai of Tohoku University, in 2005

- at ICQ9 in Ames, Iowa

-

Professor Walter Steurer of the ETH, in 2008

- at ICQ10 in Zürich, Switzerland

-

Following the rules governing the Award, the 2010 winner was determined by the current members of the International Advisory Board, with the exception of Board members who were themselves nominees, nominators, or written supporters of nominations.

Dr. de Boissieu is a Senior Researcher at the CNRS (French National Center for Scientific Research) working at the SIMaP (Materials and Processes Science and Engineering Laboratory), Grenoble, joint laboratory between Grenoble University and CNRS. He is Chair of the Aperiodic Commission of the International Union of Crystallography, and Coordinator of the CMAC Consortium, which is the successor to the European Union's Network of Excellence in Complex Metallic Alloys. He is an expert on diffraction techniques (x-ray and neutron elastic and inelastic scattering (including diffuse scattering) and has used these techniques extensively for the study of quasicrystalline materials.

The Jean Marie Dubois Award is made possible by an endowment administered by the Iowa State University Alumni Foundation.

Patricia A. Thiel

Award Secretary for the Jean Marie Dubois Award

April 14, 2010

Conference Schedule at a Glance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Registration 15:00 -	Opening 8:30	Physical Properties 8:40 - 10:20	Mathematics 8:40 - 9:40	Physical Properties 8:40 - 10:00	Formation and New systems 8:40 - 10:00
	Formation 8:40 - 10:20				
Welcome Party 18:00 -	Formation and Structures 10:40 - 12:00	Physical Properties 10:40 - 12:00	Dr. S. Ritsch Memorial 10:00 - 11:05	Applications 10:20 - 12:00	Closing 10:10 - 11:00
	New systems 13:30 - 14:50	Surfaces 13:30 - 15:10	Excursion to Noboribetsu and Shiraoi 11:20 -	Applications 13:30 - 14:50	
	Structures 15:10 - 16:50	Mathematics 15:30 - 16:50		Related topics 15:10 - 16:50	
	Poster 1, 2, 3 17:00 - 18:30	Poster 4, 5, 6, 7, 8 17:00 - 18:30		Conference Dinner 18:30 -	

Program of Oral Presentations

Monday, June 14, 2010

Session 1: Formation (chair: A.P. Tsai)

8:40-9:20 S01-01*	P.C. Canfield, M.L. Caudle, C.-S. Ho, A. Kreyssig, S. Nandi, M.G. Kim, X. Lin, A. Kracher, K.W. Dennis, R.W. McCallum and <u>A.I. Goldman*</u> i-Sc ₁₂ Zn ₈₈ : A new binary icosahedral quasicrystal
9:20-9:40 S01-02	M. de Boissieu, T. Yamada, C. Cui, H. Euchner, C. Pay Gomez and A.P. Tsai Structural quality, diffuse scattering and phasons modes in the AgInYb icosahedral phase
9:40-10:00 S01-03	W. Steurer Factors governing growth and stability of quasicrystals and other complex intermetallics
10:00-10:20 S01-04	U. Mizutani and H. Sato Hume-Rothery stabilization mechanism and d-states-mediated-Fermi surface-Brillouin zone interactions in structurally complex metallic alloys

Session 2: Formation and Structures (chair: W. Steurer)

10:40-11:20 S02-01*	M. Engel*, A. Haji-Akbari, E.R. Chen and S.C. Glotzer Quasicrystalline phase of densely packed tetrahedron
11:20-12:00 S02-02*	C. Xiao, K. Miyasaka, N. Fujita, Y. Sakamoto and O. Terasaki* Dodecagonal tiling in mesoporous silica

Session 3: New systems (chair: R. Lifshitz)

13:30-14:10 S03-01*	T. Dotera* Structural transition of dodecagonal quasicrystals and approximants
14:10-14:50 S03-02*	C. Bechinger*, J. Mikhael, L. Helden and T. Bohlein Colloidal monolayers on quasiperiodic light fields

Session 4: Structures (chair: P. Thiel)

15:10-15:50 S04-01*	H. Takakura* Structural feature of Yb-Cd type icosahedral quasicrystal
15:50-16:10 S04-02	M. Mihalkovič, M. Krajči, C.L. Henley and J. Hafner Low-temperature structure of i-AlMnPd approximants from energetic optimization: covering by "Pseudo-Mackay" clusters
16:10-16:30 S04-03	H. Orsini-Rosenberg and W. Steurer <i>Ab initio</i> investigations on the stability of sevenfold approximants
16:30-16:50 S04-04	A. Yamamoto Short-range order diffuse scattering intensity in d-Al-Ni-Co s1 and b-Ni phases

Tuesday, June 15, 2010

Session 5: Physical properties (chair: J. Dolinšek)

8:40-9:20 S05-01*	A. Smontara* Anisotropic transport properties of complex metallic alloys
9:20-9:40 S05-02	M.A. Chernikov and Yu.Kh. Vekilov Fermi-surface effects in icosahedral quasicrystals
9:40-10:00 S05-03	J.-M. Dubois and E. Belin-Ferré Electronic properties versus lattice complexity in Al-based complex metallic alloys
10:00-10:20 S05-04	S.E.-D. Mandel and R. Lifshitz The Fibonacci quasicrystal - new surprises from an old model

Tuesday, June 15, 2010

Session 6: Physical properties (chair: J. Wolny)

10:40-11:00 S06-01	<u>A. Jagannathan</u> and E.Y. Vedmedenko Quasiperiodic antiferromagnet with pentagonal loops
11:00-11:20 S06-02	<u>R. Tamura</u> , Y. Muro, T. Hiroto, H. Yaguchi and T. Takabatake Magnetic properties of Cd ₆ R 1/1 approximants
11:20-11:40 S06-03	<u>T. Watanuki</u> , D. Kawana, A. Machida and A.P. Tsai Valence fluctuation state in Yb based quasicrystals
11:40-12:00 S06-04	<u>H. Euchner</u> , M. Mihalkovič, M.R. Johnson, H. Schober, A.P. Tsai, S. Ohhashi, C. Gomez, S. Lidin and M. de Boissieu Lattice dynamics in complex zinc-magnesium phases

Session 7: Surfaces (chair: V. Fournée)

13:30-14:10 S07-01*	<u>H.R. Sharma*</u> , P.J. Nugent, G. Simutis, J. Smerdon, V.R. Dhanak, R. McGrath, M. Shimoda, C. Cui, Y. Ishii and A. P. Tsai Surfaces of icosahedral Cd-Yb family quasicrystal: structure, electronic properties and epitaxy
14:10-14:30 S07-02	C. Yuen, B. Ünal, D. Jing and <u>P.A. Thiel</u> Surface segregation in an Al-based quasicrystal: Zn in decagonal Al-Pd-Zn
14:30-14:50 S07-03	R. Addou, A. Shukla, M.-C. de Weerd, P. Gille, R. Widmer, V. Fournée, O. Gröning, J.-M. Dubois and <u>J. Ledieu</u> Cu adsorption on the (100) surface of the Al ₁₃ Co ₄ approximant
14:50-15:10 S07-04	<u>M. Krajčí</u> and J. Hafner Catalytic properties of Al ₁₃ Co ₄ studied by <i>ab initio</i> methods

Session 8: Mathematics (chair: M. Baake)

15:30-16:10 S08-01*	<u>F. Gähler*</u> Topological invariants of aperiodic tilings
16:10-16:30 S08-02	<u>J.-Y. Lee</u> and S. Akiyama Determining quasicrystal structure on substitution tilings
16:30-16:50 S08-03	<u>P. Zeiner</u> and M. Loquias Colourings of lattices and CSLS

Wednesday, June 16, 2010

Session 9: Mathematics (chair: S. Ben-Abraham)

8:40-9:00 S09-01	<u>M.L.A.N. De Las Peñas</u> , E.P. Bugari and D. Frettlöh Colourings of cyclotomic integers with class number one
9:00-9:20 S09-02	<u>N. Fujita</u> Point substitution processes for generating icosahedral tilings
9:20-9:40 S09-03	<u>M. Baake</u> and H. Kösters Random point sets and their diffraction

Session 10: Dr. Stefan Ritsch Memorial (chair: R. Lück)

10:00-10:05	<u>R. Lück</u>
10:05-10:25 S10-01	<u>P. Kuczera</u> , J. Wolny and W. Steurer The structure of decagonal Al-Ni-Co superstructure type I
10:25-10:45 S10-02	<u>A. Strutz</u> , A. Yamamoto and W. Steurer Superstructure determination of basic Co-rich decagonal Al-Co-Ni
10:45-11:05 S10-03	<u>E. Abe</u> , T. Seki and S.J. Pennycook Point-defect distributions in an ideal Al ₇₂ Ni ₂₀ Co ₈ studied by ultrahigh-resolution STEM and first-principle calculations

Thursday, June 17, 2010

Session 11: Physical properties (chair: M. Chernikov)

8:40-9:00 S11-01	R. Mäder, R. Widmer, P. Ruffieux and O. Gröning Correlating the local density of states and the macroscopic conductivity in quasicrystals and approximants
9:00-9:20 S11-02	G. Trambly de Laissardière, C. Oguey, and D. Mayou Metal insulator transition induced by long range quasiperiodic order in octagonal tiling
9:20-9:40 S11-03	V.R. Misko, D. Bothner, M. Kemmler, R. Kleiner, D. Koelle, F.M. Peeters, and F. Nori Enhancing the critical current in superconductors with quasiperiodic pinning arrays below and above the matching flux
9:40-10:00 S11-04	F. Rösch and H.-R. Trebin Brittle fracture of a complex metallic compound from an atomistic viewpoint

Session 12: Applications (chair: R. McGrath)

10:20-10:40 S12-01	H. Somekawa, A. Singh, Y. Osawa and T. Mukai Mg-Zn-Al alloys containing quasicrystal and related phases for structural applications
10:40-11:00 S12-02	X. Wang, Z. Zhang and L. Wang Preparation and wear resistance of Ti-Zr-Ni quasicrystal and polyimide composite materials
11:00-11:20 S12-03	S. Kenzari, D. Bonina, J.-M. Dubois and V. Fournée Selective laser sintering of quasicrystalline preforms: A new technological application for manufacturing functional Al-based parts
11:20-11:40 S12-04	K. Biswas, S. Kameoka, Y. Xu and A.P. Tsai A novel catalyst fabricated from Al-Co-Ni decagonal quasicrystal for steam reforming of methane
11:40-12:00 S12-05	V.K. Vani, S.M. Hong and E. Fleury Synthesis of porous Cu thin films from RF sputtered quasicrystalline Al-Cu-Co alloy thin films

Session 13: Applications (chair: K. Kimura)

13:30-13:50 S13-01	T. Takeuchi, H. Goto and M. Mikami Development of thermal rectifier using the unusual electron thermal conductivity of quasicrystals
13:50-14:10 S13-02	J. Dolinšek, M. Jagodič, Z. Jagličić, M. Feuerbacher and M. Heggen Thermal storage of digital information in the Taylor-phase decagonal approximants
14:10-14:50 S13-03*	X. Zhang* Negative refraction and localized states of classical wave in high-symmetry quasicrystals

Session 14: Related topics (chair: M. de Boissieu)

15:10-15:50 S14-01*	S. Lee*, R. Berger and R. Hoffmann Gamma-brass superstructures, perpendicular pseudo-5-fold axes, and the E8 lattice
15:50-16:30 S14-02*	S. van Smaalen* Modulated structures of low-dimensional electronic and magnetic crystals
16:30-16:50 S14-03	K. Kimura, H. Hyodo, Y. Takagiwa, K. Kirihaara, K. Soga, K. Kato and M. Takata Self-compensation and bonding-conversion in B-based and Al-based icosahedral cluster solids

Friday, June 16, 2010

Session 15: Formation and New system (chair: C. L. Henley)

8:40-9:20 S15-01*	<u>P.J. Steinhardt*</u> Once upon a time in Kamchatka: the search for natural quasicrystals
9:20-10:00 S15-02*	<u>Y. Matsushita*</u> New Complexity in self-assembly of three component polymer materials

Closing (chair: T. Ishimasa)

10:10-10:40	<u>J.-M. Dubois and R. Lifshitz</u> Concluding Remarks
10:40-10:55	Young Scientist Award
10:55	Announcement of ICQ12