Workshop in Hawaii: Aspects of SLP and WLP Tokai International College in Hawaii Honolulu, Hawaii, USA September 10 – September 15, 2012 Organizer: Junzo Watanabe

Each day there are two talks in the morning, with a long break in between. The lunch break is for two hours, beginning whenever the second talk ends. The presentations are intended to be informal, with lots of questions and answers during the talks. Moreover, the talks tend to be introductory or expository, serving as preparation for the afternoon activities; they usually are not about "my latest big theorem."

In the afternoon you can do many things: There could be lectures, problem sessions, entire group discussions, break into small groups, informal discussions, report from groups. Speakers and titles for the next morning will be determined in the afternoon session.

It seems to be a good idea to have a list of problems that can be discussed in the entire group or in a small group or among experts. If you have such problems, please send them to me or Akihito Wachi whose address is

wachiakihito@gmail.com.

We will put them in a protected on line place.

Only the first four lectures for the first day are determined in advance.

- 1. Juan Migliore: A survey on the weak Lefschetz property.
- 2. Uwe Nagel: A geometric approach to height four complete intersections.
- 3. Toshiaki Maeno: Lefschetz elements of Artinian Gorensetein algebras.
- 4. Akihito Wachi: The q-analog of the hook length formula and the SLP.

| Aspe | cts | of | \mathbf{SL} | Р | and | WLP |
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| | (Speakers and timing are tentative) | | | | | |
|------------------------------|-------------------------------------|--------------------------------|--|--|--|--|
| | Monday, September 10, 2012 | | | | | |
| ĺ | 9:00 am | Welcome & Introduction | | | | |
| | | Uwe Nagel | | | | |
| | | Juan Migliore | | | | |
| | 2:00 pm | Toshiaki Maeno | | | | |
| | | Akihito Wachi | | | | |
| | | Discussion | | | | |
| | Tuesday, September 11, 2012 | | | | | |
| | 9:00 am | Larry Smith | | | | |
| | | Tony Iarrobino | | | | |
| | 2:00 pm | m Discussion | | | | |
| | Wednesday, September 12, 2012 | | | | | |
| | 9:00 am | Leila Khatami | | | | |
| | | Rosa Maria Miró Roig | | | | |
| | 2:00 pm | Discussion | | | | |
| | 7:00 pm | Banquet | | | | |
| Thursday, September 13, 2012 | | | | | | |
| | 9:00 am | Mats Boij | | | | |
| | | Yasuhide Numata | | | | |
| | 0:00 pm | Excursion | | | | |
| | | (Beach, Zoo, Pineapple fields) | | | | |
| | Friday, September 14, 2012 | | | | | |
| | 9:00 am | Satoshi Murai | | | | |
| | | Toru Tsukioka | | | | |
| | 2:00 pm | Discussion | | | | |
| | Saturday, September 15, 2012 | | | | | |
| | 9:00 am | Uwe Nagel | | | | |
| | | Juan Migliore | | | | |
| | 2:00 pm | Discussion | | | | |

List of participants

1. Anthony Iarrobino,

Department of Mathematics, Northeastern University, Boston, MA 02115, USA

- Leila Khatami, Union College, Schenectady, NY 12308, USA
- 3. Juan Migliore,

Department of Mathematics, University of Notre Dame, Notre Dame, IN 46556-4618, USA

4. Uwe Nagel,

Department of Mathematics, University of Kentucky, Lexinton, KY 40506, USA

- 5. Larry Smith, Professor Emeritus at Göttingen
- 6. Mats Boij,

Department of Mathematics, KTH Royal Institute of Technology, Stockholm, Sweden

7. Rosa Maria Miró-Roig,

Fac. Matematiques, Universitat de Barcelona, Gran Via 585, 08007 Barcelona, Spain

- Toshiaki Maeno, Meijo University, Nagoya468-0073, Japan
- 9. Satoshi Murai, Yamaguchi University, Yamaguchi 753-8511, Japan
- Yasuhide Numata, Tokyo University, Tokyo113-8656, Japan
- Akihito Wachi, Hokkaido University of Education, Kushiro 080-0826, Japan
- 12. Toru Tsukioka, Department of Mathematics, Tokai University, Hiratsuka 259-1292, Japan
- Junzo Watanabe, Department of Mathematics, Tokai University, Hiratsuka 259-1292, Japan

Possible titles of lectures

- 1. The Lefschetz locus and general complete intersections. (Lefschetz locus for complete intersections.)
- 2. A geometric approach to the Weak Lefschetz Property for height 4 complete intersections.
- 3. The Weak Lefschetz Property in characteristic p and connections to combinatorics.
- 4. Syzygy bundles and the Weak Lefschetz Property.
- 5. The WLP and surfaces.
- 6. The Weak Lefschetz Property for powers of general linear forms.
- 7. Applications of Lefschetz properties in face vector theory.
- 8. Sperner property and finite-dimensional Gorenstein algebras associated to matroids I, II.
- 9. Weak Lefschetz Property for monomial ideals (related to topics 2 and 3).
- 10. The k-Lefschetz properties of a tensor algebra.
- 11. The q-analog of the hook length formula and the SLP.
- 12. The decomposition of the exterior algebra of the differential moudule into irreducible S_n -modules.
- Introduction to the theory of Gordan-Noether: "The algebraic forms whose Hessian determinant constantly vanishes" in Mathematische Annalen, bd 10, 1876.
- 14. Completely m-full ideals and componentwise linear ideals.
- 15. Hessians and higher Hessians.
- 16. Central simple modules of Gorenstein algebras.
- 17. Fano varieties and the Hard Lefschetz Theorem.
- 18. The poset of the nilpotent commutator of a nilpotent matrix.