The Nash conjecture was answered in the negative by this result. However one could ask how far this conjecture is from the truth. Nash's original results imply that if the requirement about projective space is dropped then the statement is true and by works of Akbulut-King, Benedetti-Marin and Mikhalkin it is known that every compact differentiable manifold can be realized as the set of real points of a real algebraic variety (possibly singular), which is birational to projective space.

Recently Kollár came forward with yet another stunning result. He considered the case when one relaxes the only condition that has been common to all of the previous versions: projectivity. To the great surprise of many, Kollár proved that the Nash conjecture actually holds in the following form:

For every compact connected differentiable 3-manifold M there is a compact complex manifold X which can be obtained from $\mathbf{P}^3$ by a sequence of smooth real blow ups and downs such that M is diffeomorphic to $X(\mathbf{R})$, the set of real points of X.

Possibly the most surprising fact is that the previous result established that this statement could not be true if one required X to be projective. Furthermore, the class of compact complex manifolds described in the statement is very close to being projective. Given that, one would naturally expect that Nash's conjecture would still fail in this class. Kollár has developed a whole new theory around this question that is certain to bring new tools and ideas to many other questions and generate a lot of new research in real algebraic geometry.

This piece of work has potential interest for a wide range of audiences. Ideas and methods from differential and algebraic geometry, topology and algebra play important roles in Kollár's work. One can be amused simply watching how these different disciplines play together in harmony conducted by one of the best in the business.

— — — — — — — — — — — — — — — — — — — —

The 2003-04 Milliman Lecturer will be Alain Connes. Connes received, among various other prizes, a Fields Medal in 1982 for the classification of von Neumann algebras, and the Craaford Prize in 2001.

He is currently a permanent member at IHES, and also holds a chair at the College de France in Paris. He is a member of several National Academies, including those of France, Norway, Denmark, Canada, and the United States. He is a fellow of the Royal Society.

Connes' interests are very broad, ranging from physics to number theory. His main claim to fame is as the primary creator and mover behind the field of non-commutative geometry. The starting point for this is the theory of operator algebras, but what really distinguishes his work is the many ways in which he has connected this subject to other fields of mathematics. He has written a beautiful and unusual book on the subject in which the emphasis is on presenting ideas and connections rather than proofs. He has used the ideas of non-commutative geometry to develop new methods for renormalization theory and the standard model of quantum and particle physics, and to attack the Riemann Hypothesis. Another of his inventions is cyclic homology.

Answer to puzzle on page 7: 632

MATHDAY

The thirteenth annual Mathday will be held on the campus of the University of Washington on March 24, 2003. On that day 1,200 high school students from around the state will attend lectures and panel discussions, participate in hands-on activities, and go on field trips to labs on the campus. Students come from all over the state of Washington and in recent years we have always had representatives from the state of Idaho. The first Mathday was held in 1991. This year the plenary speaker will be Nathan Kutz from Applied Mathematics. Guest lecturers will include Millie Johnson (Mathematics Department, WWU), Cliff Mass (Astronomy Department, UW) Sándor Kovács (Mathematics Department, UW), and others not yet confirmed at the time this article is being written. In 2002 there were more than twenty different activities and field trips. There is a website, http://www.math.washington.edu/~morrow/bookmarks.html, which will be updated with current information. Undergraduate students, graduate students, staff, and faculty contribute to the success of this exciting, educational day in which students learn about the uses of mathematics in academic research and industrial research and development.

VISITORS

Each year the Department welcomes many visitors; these visitors, who come for varying periods of time, teach for us and participate in our seminars. They make significant contributions to the life of the Department. That our visitors come from all over the world attests to the international nature of our subject and to the Department's attractiveness as a center of mathematical work.

Klaus Schmidt, Director of the International Erwin Schrödinger Institute for Mathematical Physics and Professor at the Mathematics Institute, Vienna, Austria. Visiting Professor 2002-03. (Ergodic theory, Harmonic Analysis, Probability Theory, and Operator Algebras.)

Vladimir Sharafutdinov, Head Researcher at the Sobolev Institute for Mathematics and Professor of Mathematics, Novosibirsk, Russia. Visiting Professor Winter and Spring Quarters. (Differential geometry and topology.)

Dmitri Kozlov, Associate Professor, Royal Institute of Technology, Stockholm, Sweden. Visiting Associate Professor Winter Quarter. (Combinatorics, algebra, and topology.)

Stefan Kebekus, Assistant Professor, Bayreuth, Germany. Visiting Assistant Professor Autumn Quarter. (Complex algebraic geometry.)

Daniel Rogalski is a National Science Foundation Postdoctoral Fellow. He received his PhD from University of Michigan, 2002. (Noncommutative rings and noncommutative algebraic geometry.)