Dear Friends,

Eka (pronounced `Ay-ka') was born May 18th at 4:45pm; he weighs 7 lbs, 14 oz. Both he and Shelly are doing well. Here are a few pictures of him with his parents. Please feel free to pass the news along.

Best Regards,
Chetan

Is topological quantum computing really a feasible route to large-scale quantum computing? What experimental and theoretical problems need to be solved for topological quantum computing to become a reality? What is a reasonable time table?

Does topological quantum computing really have important advantages relative to other approaches (e.g., ion traps, spins in quantum dots, superconducting qubits, etc.), and what are the disadvantages?

Will the standard (nontopological) theory of "brute-force" quantum fault tolerance really be adequate on its own for controlling decoherence, or will some form of topological protection prove to be necessary?

Will a topological quantum computer really be so resistant to noise that this standard theory will be obviated? If not, how should topological protection be supplemented by other methods of error control?

Will it be feasible to realize universal fault-tolerant quantum computation using the Pfaffian quantum Hall state, supplemented by nontopological gates or “tilted interferometry”?

What are the prospects for realizing topological quantum computers not with quantum Hall systems but in some other way, e.g., with atoms or polar molecules trapped in optical lattices, or with Josephson junctions?

Does the topological paradigm suggest new applications and algorithms for quantum computing?

How interesting is topological quantum computing just from the perspective of basic physics (never mind the potential technological implications), and from this perspective what new questions and avenues of investigation does it open up?

Why are topological ordered phases so rare in realizable physical systems?

What have we learned at the KITP that we didn't know 3 months ago?

Some other open questions discussed here:

In wave functions derived from conformal field theory, does statistics agree with analytic continuation of conformal blocks? (Read)

What is the effective field theory for tunneling at a quantum point contact in e.g., the Read-Rezayi states? (Fendley)

Can we classify topological phases? Are there (chiral) anyon models that are not associated with quantum groups? (Wang)

Is the anyon model (modular tensor category) completely determined by properties of the ground state (without reference to any Hamiltonian)? (Levin)

Is a gap necessary for topological order? (Fradkin)

Is there a nontrivial notion of “braiding” in one dimension? (Freedman)