Fast Forward will be defined more completely as I determine the number of groups.

Paper length (your papers) are required to be a minimum of 6 pages, spacing of 1.5 lines and margins of no more than 1" on all sides.

Topics for Papers and Fast Forward

Computer-Assisted Theorem Proving
    Semi-Automated Theorem Proving
        http://homotopytypetheory.org/book/
    Four-Color Problem
        http://www.ams.org/notices/200811/tx081101382p.pdf

Collatz Conjecture: The 3x+1 problem
    https://www.maa.org/sites/default/files/pdf/upload_library/22/Ford/Lagarias3-23.pdf

    Factor Replacement
    $2x \rightarrow x$
    $x \rightarrow 3x+1$
    Unordered Factor Replacement or Petri Net
    $2x \rightarrow x$
    $2x+1 \rightarrow 6x+4$
    2-Tag System where start with a sequence of a's
    $a \rightarrow bc$
    $b \rightarrow a$
    $c \rightarrow aaa$

Bryans, N., Chiniforooshan, E., Doty, D., Kari, L., & Seki, S. (2013). The power of nondeterminism in self-assembly. *Theory of Computing* 9(1): 1-29.
    http://theoryofcomputing.org/articles/v009a001/

Chen, H-L, Doty, D. & Soloveichik, D. (2014). Rate-independent computation in continuous chemical reaction networks. *Proceedings of the 5th Innovations in Theoretical Computer Science Conference*, (Princeton, New Jersey, USA, January 12-14, 2014), pp. 313-326.
    http://www.dna.caltech.edu/~ddoty/papers/dfccrn-journal.pdf

Chen, H. L., Doty, D., & Soloveichik, D. (2012). Deterministic function computation with chemical reaction networks. In *DNA Computing and Molecular Programming* (pp. 25-42). Springer Berlin Heidelberg.
    http://www.dna.caltech.edu/~ddoty/papers/dfccrn-journal.pdf

Cook, M. (2004). Universality in elementary cellular automata. *Complex Systems*, *15*(1), 1-40.

http://www.complex-systems.com/pdf/15-1-1.pdf

Doty, D. (2012). Theory of algorithmic self-assembly. *Communications of the ACM* 55(12): 78-88.
http://www.dna.caltech.edu/~ddoty/papers/tasa.pdf

Doty, D., Lutz, J. H., Patitz, M. J., Schweller, R. T., Summers, S. M., & Woods, D. (2012). The tile assembly model is intrinsically universal. In *Foundations of Computer Science (FOCS) 2012*, 302-310.
http://www.dna.caltech.edu/~ddoty/papers/tamiu.pdf

Neary, T., & Woods, D. (2006). P-completeness of cellular automaton Rule 110. In *Automata, Languages and Programming* (pp. 132-143). Springer Berlin Heidelberg
http://link.springer.com/chapter/10.1007/11786986_13

Topics that you might choose from

Arora&Barak, *Computational Complexity: A Modern Approach*, Cambridge University Press, 2009.
http://www.cs.princeton.edu/theory/complexity/

Oded Goldreich, *P, NP, and NP-Completeness: The Basics of Complexity Theory*, Cambridge University Press, 2010.
http://www.wisdom.weizmann.ac.il/~odedg/bc-drafts.html

Oded Goldreich, *Computational Complexity: A Conceptual Approach*, Cambridge University Press, 2008.
http://www.wisdom.weizmann.ac.il/~odedg/cc-drafts.html

Examples from above are:
Interactive Proofs
Probabilistic Computation
PCP Theorem (Hardness of Approximation)
Probabilistic Proof Systems
Quantum Computing
Randomized Algorithms
Promise Problems