1154-20-572 **Janusz Konieczny*** (jkoniecz@umw.edu), University of Mary Washington, Department of Mathematics, Fredericksburg, VA 22401. *Maximal Commutative Subsemigroups of a Finite Semigroup.*

Let S be a finite non-commutative semigroup. This talk will be concerned with the problem of finding maximal *commutative* subsemigroups of S, that is, commutative subsemigroups of S that are not properly included in any commutative subsemigroup of S.

For an element $a \in S$, denote by $C^2(a)$ the *second centralizer* of a in S, which is the set of all elements $b \in S$ such that $bx = xb$ for every $x \in S$ that commutes with a. It is clear that $C^2(a)$ is a commutative subsemigroup of S. Let M be any maximal commutative subsemigroup of S. Then $C^2(a) \subseteq M$ for every $a \in M$. We define the *commutative rank* (*c-rank*) of M as the minimum cardinality of a set $A \subseteq M$ such that $\bigcup_{a \in A} C^2(a)$ generates M.

I will present a general approach to the problem of finding maximal commutative subsemigroups of S of c-rank 1 and 2. Note that if S is a finite group, then the commutative subsemigroups of S are the abelian subgroups of S. Let S_n be the symmetric group on n elements. I will use the general approach to determine the maximal abelian subgroups of S_n of c-rank 1 and describe a class of maximal abelian subgroups of S_n of c-rank at most 2. (Received September 07, 2019)