

Introduction: The South African Space Resources Association (SASRA) was founded as a voluntary association on 19 February 2011. The initiation of SASRA was presented at the PTMSS/SRR in June 2012¹. Since that time SASRA has been registered as a non-profit company, has seen a number of successes, and has initiated a couple of additional projects. This paper compares SASRA's current state with its goals presented in June 2012, and discusses its challenges and way forward.

Reconciliation of objectives and projects: SASRA was founded with three objectives, and the non-profit company adopted these objectives with slight modification.

- Awareness (5 successes)
- Technical contribution (3 successes)
- Education (2 successes)

The "future" project presented in 2011¹ is listed below, with its updated statuses:

Project	Status
Structural lunar soil simulant	Delayed pending prototype lunabot
PISCES student design	Shelved
NASA lunabotics	In progress
Paper on lunar mine design, possibly sand mining	Completed
Paper on evaluation of pneumatic excavator	Shelved
Mining innovation overlap	Restructured

Achievements to date: SASRA is an opportunity based organization, and has worked on a number of endeavors which could not have been planned for. These are mentioned below.

- Conference presentation at the "Robotics and Mechatronics Conference of South Africa 2012", with the paper entitled "Space Mining Application for South African Mining Robotics"².
- The above paper is to be republished as an article in the robotics edition of EngineerIT. That edition of EngineerIT includes an article where the author was one of the interviewees
- Dual author conference paper at AIAA, entitled "A Mining Engineering Approach to Mining Lunar Regolith"³.
- SASRA co-hosted a robotics evening with the CSIR and IEEE. The evening included a

presentation by the author on "The Ingredients of a Space Faring Civilization" and tele-operation demonstration with PISCES.

- Two articles in "Mining Weekly", with the author as the the main interviewee^{4,5}.
- A software application on the NASA Lunabotics was developed and donated to the competition, resulting in Bronze Sponsor status for SASRA
- Started looking for Earth investors for Space Mining Technologies. A paper submitted to SRR/PTMSS this year details the initial work.
- Successfully hosts 1 social event per month, with the technical meetings running in between.
- Established social media channels (ie Facebook and Twitter) to spread awareness.

Current and future projects: A number of projects have been taken on, the progress of which will be presented:

- Ore Genesis: An educational game based on the "Alchemy" concept. This game is aimed at teaching the players about space mining, and acts as a conceptualization tool for more advanced games and simulations.
- Mxit University. A learning platform targeted at the demographic with little access to bandwidth and/or without smart phones. The concept can be migrated to more sophisticated platforms at a later stage. This vehicle is also intended to train and grade SASRA members on Space Mining knowledge.
- Lunabot: SASRA is building a prototype Lunabot, with the intention of attracting interest in the NASA Lunabotics.
- Space Mining Wiki: An online collaborative effort to capture the literature and news regarding different aspects of Space Mining
- Earth Application: continued work looking for Earth clients interested in Space Mining Technologies

Challenges and the way forward: SASRA is experiencing a number of challenges. The proposed solution is a mindset change towards being more business orientated. The mindset change is discussed in the presentation. The challenges are listed below.

- Time (voluntary part time company)
- No remuneration for people doing work
- Little money to invest in projects
- Lack of member involvement
- Lack of members benefit

Conclusion: The 2011/2012 year has been rewarding for SASRA, even if all the planned tasks were not completed. Challenges are foreseen for the 2012/2013 year, but plans are in place to deal with the challenges.

References:

- [1] Neale, A.M. (2011) *South Africa Awakens to Space Resources*. 2nd PTMSS/SRR. Ottawa, Ontario.
- [2] Neale, A.M. (2011) *Space Mining Application for South African Mining Robotics*. RobMech. Pretoria.
- [3] Kluge, P. and Neale, A.M. *A Mining Engineering Approach to Mining Lunar Regolith*. 50th AIAA ASM. Nashville.
- [4] *Mining Weekly* (2011) *Mining engineer wants SA to position itself as a mining-in-space resource hub*. 2 September.
- [5] *Mining Weekly* (2012) *Advances in autonomous robots seen as key to unlocking asteroid mining*. 10 February.