Last summer I participated in the NASA Ames Academy, NASA’s premier student leadership training program. For three months the NASA Ames Research Center, located in the heart of Silicon Valley, was my home. Driving around in this area feels like surfing the web as you pass by the HQ’s of Google, Facebook, Apple, LinkedIn and many more.

As NASA’s most diverse center, Ames fits perfectly in this highly energized environment, with activities ranging from supercomputing to astrobiology. This entire setting resulted in the ideal combination for an amazing summer experience!

THE NASA ACADEMY
The Academy is not your regular internship. Founded in 1993 the Academy currently consists of three independent programs hosted at different NASA centers: Glenn, Marshall and Ames. Each year, twelve to fourteen talented students from a wide variety of scientific and engineering backgrounds participate in the Academy, which entails individual and group research projects guided by NASA scientists, (informal) meetings with leaders in the space industry, company visits and team building excursions. The goal of the Academy is to prepare these students for a future leadership position in the space sector by giving them an insight into the inner workings of NASA and the space industry in general.

ACADEMY SELECTION PROCEDURE
Normally, only US citizens can participate in the Academy, but ESA has an agreement with NASA to send students to the Goddard and Ames Academy. In December of each year, ESA announces the opportunity on their education website and states a list of needed application materials. In total, I handed in 34 pages of material by the end of January and two months later, I learned that I had been selected. It was quite some work assembling all these materials, but if you are interested, just give it a try! The level of the Delft space students is internationally known, so you will definitely have a good chance!

ACADEMY LIFE
In my Academy we were with fourteen students: eleven from the US and three international students, one being me. Together we lived in an apartment complex just outside of Ames, which was a good setting to get to know each other. On a normal day we would depart at 7:15 to the Ames Cafeteria MegaBites for breakfast, after which we would work on our group and individual research projects for the remainder of the day. In the evening we had dinner together before doing some extra work on the group project or, if we were lucky, enjoyed the hot tub at the apartments. As it turned out, normal days do not exist: every day we would either have a lecture, a company visit or a team building activity during the day, and/or a private lecture or excursion in the evening. And that was during the days that we were at Ames, as in total we stayed over two weeks at different locations! Next to the busy weekdays almost all of the weekends were filled with activities, so that only six or seven days of the entire ten weeks were ‘schedule free’. This summer at the Ames Academy was one of my most intensive and amazing summers ever and in this article I will give you an overview of the best experiences, starting with a description of the projects I worked on.

RESEARCH PROJECTS
For my individual project I worked on a meteor shower observation campaign in collaboration with the SETI Institute. The specific meteor shower I investigated is
produced by a short period comet in a six-year orbit around the Sun. Meteor observations play an important role in determining the composition of the early solar system and the role comets might have played in the development of life. Next to that, the spectrum generated by these particles entering the atmosphere gives crucial information needed for the development of thermal protection systems. My goal was to design an observation campaign and to identify measurements needed to maximize the scientific return of such a campaign. Working on this project brought me in touch with scientists, but also with engineers, working on the thermal protection system for future Mars Sample Return missions.

Our group project focused on a preliminary study of a habitat construction system for the future colonization of the Moon using in situ resources and biological means. The idea was to use cement-producing bacteria and lunar regolith as an affordable alternative over construction material brought from Earth. We divided the group into two teams: one team focused on the biological aspects of keeping the bacteria alive and maximizing cement production and the other focused on the design of a system that would use the biocement to construct habitats. For this project I was the project manager, but besides that I also worked in the biology team as this was a great opportunity for me to experience working in an unfamiliar field. I spent quite some hours in the lab where I cultivated bacteria and mixed them with lunar regolith stimulant to create lunar bio bricks, which after ten weeks of procedure optimization led to reasonably strong bricks: perhaps the stepping stone to future lunar colonization.

MEETINGS WITH THE PROFESSIONALS
Next to working on interesting research projects I also attended dozens of lectures which gave me a good insight in the current American space activities. In the ten weeks I listened and spoke with not less than five astronauts, talked with the leading expert on Mars, Dr. Chris McKay, met the NASA Administrator Charles Bolden and had a wine tasting with the Ames Center Director Dr. Pete Worden. The energy with which these people advocated spaceflight was contagious and these talks only made me even more enthusiastic to start my career in the space sector as there are so many amazing things you can work on.

VISITING THE SPACE SECTOR
During the ten weeks we visited numerous companies and the two most spectacular ones were SpaceX in Hawthorne (Los Angeles) and the Kennedy Space Center in Florida. In Hawthorne, SpaceX produces their Falcon rockets and Dragon capsule in a hall right next to the office where their design team works. There they build everything from electronics to complete Merlin Engines, and in the middle of the factory they constructed a clean room for the assembly of the Dragon capsule, with which they plan to fly cargo and crew to the ISS and eventually to Mars!

At the Kennedy Space Center we got to see the main launch facilities with the two Space Shuttles as highlights. The first one, Endeavour, was located in the Orbiter Processing Facility. As we walked underneath the Shuttle we could see the impacts of orbital debris and, as it was so close, we even got to touch the orbiter! The other bird we saw was the workhorse of the fleet, the Discovery, which we got to see from up close (Figure 1). On the next day we were VIPs at the launch of the Juno spacecraft on top of an Atlas V. With much anticipation, we waited for the final countdown. Once the clock hit zero, a bright flash was visible after which the rocket soared into the sky. Right after the launch we rushed over to the Cape Canaveral Air Force Station, where we visited the SpaceX launch pad just 2.5 km away from the pad where Juno left the earth only an hour ago. At the launch pad (Figure 2) we got to see the fully assembled Falcon 9 rocket, waiting to be launched to the ISS at the end of this year.

Next to the space related trips we also visited some of the beautiful surroundings of Silicon Valley such as San Francisco, Lake Tahoe and Yosemite National Park, where we camped in the outdoor and climbed Half Dome, which offered us an amazing view (Figure 3).

LOOKING BACK
With all the great experiences of last summer in mind, I am very much interested in going back to the US and especially Ames. The people here welcome international collaborations, which I think is essential for future large space projects. The US is currently the leader in the space sector and there are many great opportunities, so it is definitely worth a shot to try to get a job there!