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Studienort Wilhelmshaven
Fachbereich Ingenieurwissenschaften

USA-Exkursion 2012



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Field trip to the DLP Plant in Dallas, TX, a subsidiary of Texas Instruments

Alexandra Rebecca Gerling

After waking up way to early - thanks to our jet lag - our hotel served a typical American breakfast. We were thrilled by the variety and were immediately sold on the United States.

After check-out we drove to DLP which stands for **D**igital **L**ight **P**rocessing, a subsidiary of Texas instruments and one of the biggest employers in Texas. They produce micro-mirror devices, a way of projecting pictures onto a screen.

We were warmly welcomed by Kris and Doug, two engineers at DLP. They showed us the visitor's center, where different uses of the micro-mirror devices are displayed, as well as the development of the company.

One of the most impressive things was a pocket-sized projector which was still able to project a perfect picture on a cinema screen in the front of the room.



The mirrors only work in combination with an external light source. They are able to flip 10,000 times a second and by this blend the colors reflected into one – at least for the human eye. The colors are usually produced by a color wheel or by individual monochromatic lasers. Depending on the purpose those techniques are mixed.



For the differently sized projectors different chips are used ranging from 750,000 to 4,000,000 individual mirrors. But not one is bigger than 4 square centimeters.

When we had seen and tried our everything in the visitor's center, we went inside the plant to take a look at the test labs and to talk to the product engineers responsible for the reliability of the product.



DLP's products are so reliable, that they have a test stand which has been running for more than 16 years, but the micro-mirrors are still working!

Outside the laboratory is a great system to reward successful engineers in the company: the "wall of patents" where every engineer who had a patent recognized gets his own tile. Those who manage to get several patents are specially recognized by being put in a special section. This system ensures everyone's work is valued according to its impact on the company's future.



After a great tour of the plant we had to get on our way to Lubbock, TX a 4 ½ hour drive. We took the scenic route, leading us by a lake where we cooled off for a while and then continued our journey.



The Texas country really looked like it is stereotyped in movies with oil and gas pumps in the fields next to the endlessly long highway and little villages scattered apart in the desert-like landscape.

Arriving in Lubbock it was almost 11pm and we were all ready to go to bed, but beforehand we went out to get a bite to eat in the only restaurant still opened: Ihop.

This typically American food amazed all of us. And pancakes at midnight taste just as great as they do for breakfast!



First day at TTU (Lubbock, Texas)

Michael Strutz

Waking up at 8 o'clock. It was a short but peaceful night in a king-size bed, which are typical for motels like this where we stayed. After a US-Style breakfast, we got in our cars drove right to the Texas Tech University. There John E. Kobza Ph.D Professor Industrial Engineering kindly welcomed us and gave an overview of what we are going to do in the time of our stay.



We split our group of students into two and were presenting our university of applied science to the students of the Texas Tech University. They were interested a lot in our university and the opportunity of coming to Germany for the summer course program. When the groups changed we had a walk over the campus and we were just impressed how huge it is. The whole campus is clean, well-furnished and has beautiful looking buildings in Italian style.



Sascha Schneider and Linus Franz Pohle, students of Jade-University were presenting a presentation about the education system in Germany and an interesting discussion with U.S. students started.

Right after a short break we need to prepare the presentations of the students. Everything started with a short introduction about the importance of globalization, followed by a presentation about the exchange program of the 'Jade University' and two really interesting presentations of students from the 'Jade University'.



Referring to this introduction the presentations started. The first presentation by a student of 'Jade University' was about the theme, how to study practice-oriented as in an integrated degree program and the comparison of Airbus and Boeing.

The second presentation by another student of the 'Jade University' was about his experience in the company 'Brötje' in Germany.

14:00 TTU Wind Energy Faculty presented wind energy in Texas the plan for the future and what happened until now. They offered some opportunities of cooperation with Jade-HS. The officials negotiated the conditions of some offers.



15:15 After short break we went to the technical laboratories, which were just incredible good equipped with a lot of tools and technic. We had a tour through the laboratories and workshops where the students are planning and realizing systems for weather research. These systems are used for Hurricanes in whole Texas and even in the whole United States. The Texas Tech is getting money from investors, who are interested in weather, because of that there is a lot of research in this topic. To test buildings of their wind related behavior, they use a wind channel, which was built in a quite short amount of time. There were at first some little problems, but the professors and assistance knew to fix them and now the wind channel is used for a lot of experiments.



One of the most impressing equipment on Texas Tech is the hurricane/tornado simulator, it was told us being the biggest in the world. The simulator was looking spectacular to us and we were so interested in seeing what it would look like if it is working. Unfortunately we didn't tell the operator early enough so he couldn't show us, but he had to tell us a lot of very interesting stories about their experiments.



To test how much damage pieces of buildings can do to walls of save rooms they use a canon, which can shoot with much pressure huge pieces of wood. The operator told us that even discovery channel with the show myth busters did some season in this laboratories.



Unbelievable was the unused airfield / airport where the tallest building of the campus stands. It is a 200 meter high tower that provides weather information in all over the full height. It measures' wind speed, temperature, wind direction and air humidity. We ask to go up there, but it was too windy. However this showed us another experimental device. A traffic light, which is standing there to diagnostic the behavior, if wind is too strong and how it is possible to reduce the mechanical oscillations.



When we drove back, we had a lot of fun with a furious drag race and some cool drifts on the airfield.

At the evening, Texas Tech students planed and served a beautiful yummy dinner and we got in contact with kind people. After a short time of silence everybody was talking to someone they didn't know before.

When we had to leave the campus, some made plans for the next days and we left to our Motel, where the wonderful day ended in a group meeting.

Palo Duro Canyon and Amarillo

Janko Moritz

The Wednesday starts at 8 p.m. Even although all participants celebrated the arrival in Lubbock in the last night and tried some of the good American beer but nobody was too late in the morning. We started our way to the Palo Duro Canyon near Amarillo. On the way several people used the time to catch up some sleep. The 2hr tour was a little bit boring, because the land was very flat und there was nothing to look at, but just arrived at the Canyon there was an impressive view over the landscape. Directly in front of us there were huge mountains and deep valleys. Then we had to pay some little admission at the entrance to get into the park. Our first program point in this morning was horseback riding. None of us had experience in horse riding, so we get some information's from the riding master. He said that it is very easy to ride the horses, because they will do every day the same thing. It looked as if the horses running like a automatic machine. Divided into two groups, we went for a one hour tour into the canyon. The tour was easy and leisurely, only the horses made from time to time a short pee break. All of us arrived healthy and happy at the start point.



At 1 p.m. we made a little lunch break. Dr. John Kobza donated chips, cookies and some iced water. Thank you for this. After the meal, we drove around the canyon and took some great photos of the landscape and from our group.



At 2 p.m. we left the canyon and drove into the direction “Cadillac Ranch”. On our way we looked a little bit troubled into sky, because where was the sun sill, but we said “hey we are in Texas right now, there is no rain”. Arrived at the ranch it was a crazy view over the ten Cadillac’s. Every vehicle’s front was buried into earth and there was so much paint on it.

Unfortunately, our visit was short, because the sun did not come back and it started to rain. It was a heavy rain shower and quickly all of us disappeared into the cars.

After a short meeting we drove to “The Big Texan” steakhouse. The legendary Big Texan. All of us heard something about the steakhouse but nobody was there before, so the anticipation was great. Just arrived there was the first decision for everyone of us: Who want’s to try the 72oz Steak menu in one hour? At the entrance you could look at the huge menu and think about your decision. None of us would try it, because it’s definitely too much to eat.



Nevertheless we all were happy to eat in an original Texas Steakhouse. The food was great and with the time we also arranged with American beer.

At 6 p.m. we arrived back home in Lubbock. In the evening there were no official activities planned, so many of us used the time to check out the club scene in Lubbock. Late in the evening all of the party people agreed that Lubbock is definitely a good place to go out and met some other students.

Even if we were foreigners there were no problems with local students. Quite the contrary, we were very well received by the Americans and had a lot of good talks. Back in the hotel all were fast asleep, because the next day we get up early in the morning.

Campus Tour at TTU

Patrick Gerdes

At the morning of the 13th September we arrived at the the Robert H. Ewalt Student Recreation Center. This centre made us speechless. One can only define this building with the word 'massive'.

As my eyes tried to compare this building in front of me with the main building of our 'Fachhochschule' back home, it let me think about the phrase " Big, bigger, America".



None of us did ever see such a huge sport building as well as their professional high tech equipment. The sport centre owns an outdoor pool and an indoor pool. Well, if someone wants to take a swim in the indoor pool under the sky, that person can just remove the roof.

You can play all sorts of sport activities like squash, ping pong, soccer, volleyball, basketball and so much more.

It was unbelievable for us students, to see such a big offer of sport activities on one campus.

If one does not want to join a group play, the students can do their work out in private or just relax with their friends. This place offers a spot for everyone, which is rare in most of our German sport centers.

So everyone can imagine, that it was a highlight for everyone to get an access card to actually use most of the sport equipment and to do our own expedition through such a remarkable building.

A big thank you, to all who made this adventure possible for us.

Soon after this we were able to meet the Dean of the Engineering College Dr. Al Sacco, who gave us a welcome at his faculty.

At noon we had a very tasty lunch and we enjoyed a short break before Mr. Luebben started his lecture about the exchange program (summer school), followed by comments from a participant (Chris) of the last summer course.

Later, at 2:00 p.m. we visited an interesting lecture about job interviews, which shows that the roles are much like ours in Germany to be successful at a job interview. The professor was highly motivated and committed. Directly after this we meet the German double-master students.

In the evening we had a guided tour of the mechanical part of the university. There we could see some research institutions. For example a video, this was recorded with a high speed camera, and which shows how a powder reacts when it is lit.

After this we saw a racing car, which was developed by students. That was really interesting, because the students have all been constantly developed.

Particularly interesting were the biomechanical analysis and the nanoparticles investigation. Especially with these two companies was very much specialized knowledge required. Nevertheless, the student explained it well. Finally, we were at the workshop. Were there we were shown around and saw where the race car was built. It was really good to see how old the machines are.



At 18:00 this time we should have an American dinner, unfortunately none of the Americans joined us for dinner. So it was just us Germans and some American Pizzas.

Field trip to X-FAB in Lubbock, TX

Lasse Maaß

On September 14th we visited X-Fab. After a short ride with our cars we arrived at the huge plant area right on time at 9.30 am. In front of the entrance Marcus Borhani awaited us already. He is Product Engineering Manager at X-Fab and showed us the company with the different steps of the wafer-processing.

X-Fab is a German company with its headquarter in Erfurt. Lubbock is one of four production locations besides Dresden, Germany and Kuching, Malaysia.



All together there are about 2400 employees at X-Fab. The company manufactures wafers for automotive, industrial, consumer, medical, and other applications on modular CMOS and BiCMOS processes in geometries ranging from 1.0 to 0.18 μm , and special BCD, SOI and MEMS long-lifetime processes. I just copied this complete sentence because for me, as a mechanical engineer, all this terms are quite unknown. That is why the short introduction given by Mr. Borhani was very interesting and gave me a little idea what it's all about.



X-Fab manufactures so called wafers. These are circular slices of silicon which are the basement for tiny and very small electronic elements (IC, chips). On one wafer there are hundreds or thousands of these elements depending on the diameter of the slice. Later on they will be mounted on a chip which you can find in every electronic device. Some of the products of X-Fab are delivered to the Silicon Valley and you can even find them in the iPhone. But the costumers are spread all over the world, especially in the UK, in Germany, in Asia and North America.

The production is divided into four different parts. Lot Starts, Chemical Vapor Deposition (CVD), Plasma and Wet Process. In each part minute conducting paths are either acid-treated or additional layers are brought on top. The end product is one wafer with many different elements, themselves exist of up to 15 layers.

Learning from a brochure and the words of Mr. Borhani, X-Fab assigns much value to research and customer collaboration with technical support. The quality is proved by some ISO certificates.

To get the highest possible quality and to avoid faults in the production it is necessary having a very clean room. Therefore all workers had to wear a whole-body work-suit with face mask and gloves. Above that the air is filtered all the time and a constant temperature is ensured by the air conditioning. This is also the reason for the high electricity consumption. On very warm days over 10 MW electricity are required. An interesting point was that X-Fab thought about building an own wind turbine on their area, but unfortunately this failed because of the nearby airport.

We only saw the production facilities behind orange colored windows. The reason for this was an UV filter. In some process steps the products are treated by UV light and that is why additional daylight has to be blocked.



The production of a wafer includes approximately 200 individual steps and takes a total of 4-8 weeks. Therefore, the machines run 24 hours a day, 7 days a week. This means for the workers a job around the clock. At X-Fab there are two 12 hour shifts, each from 7 to 7 o'clock. The week is limited to 3-4 days of work. For me, it was amazing to hear that some workers regularly work at the night shift.

To avoid that one worker forgets one step, everyone has to register and confirm all his actions. In spite of all quality activities it could happen that particular elements on the wafer are not working, this could cause e.g. of some remaining dust particles. But only the costumers know how many of the end products are failure because it is on them doing the quality inspection. We assumed that the numbers are not published by them to get a wider range for the prices.

In the production facilities in Lubbock it is possible producing up to 30000 wafers a month. The current production is about 15000 to 20000 wafers a month.

For everyone who is interested in this topic and who wants to enter into the business of semiconductor technology there are a lot of possibilities at X-Fab. Mr. Borhani told us that he could allocate some practical trainings or traineeships in different disciplines of engineering.



All kinds of engineers are involved into the development. Physicists, chemists, electrical engineers, industrial engineers and even mechanical engineers have to cooperate and work together.

The visit at X-Fab was a very interesting experience for me because it gave me a broad idea of the production of all the small electrical components. Previously I could not imagine how these things are produced.



The contact between the Jade Hochschule and X-Fab offers perfect chances to get a deeper look into this business.

Last day in Lubbock and football game

Marvin Bunjes

On day 7 was our first free morning without any meetings. Some of us used the free time to go for a swim or spent their time for a racquetball match at the Rec Center. Our first item on Saturdays list was a group photo in front of the Texas Tech sign at the campus entrance. After this we joined the ACS (American Chemical Society) to have a Tailgate with them.



We played Ladder Toss, ate a lot of their great burgers and also had many cans of beer. It was quite exiting to chat with them, learning something about their habits and their way of celebrating the time before a Texas Tech football match.



However, after a few hours some of us realized that there was another student association, the IEEE, waiting for us where we were invited originally.

This makes it even more amazing how the ACS included us in their Tailgate. At the second Tailgate, an original and really good BBQ with German like Weißbier was waiting for us. So we spent more time eating, drinking and chatting with other students.

But the highlight of that day was the match of the Red Raiders in the huge American Football stadium. Fortunately, we arrived just when the amazing show with a lot of musicians and flags started. For us Germans it was very impressive to see about 80,000 people in that stadium following a student match. It was just unbelievable because even at a German soccer match in the highest league, the Bundesliga such crowded games are rare. Luckily some Tech students went with us and so they explained a lot about American Football and everything around it.

The match in the end was a clear win. The Texas Tech Team won with a lot Touchdowns, First Downs and a big lead.



The evening after the game most of us spent our time at bars or clubs. However the nights in Texas are short because of the closing time. On the other hand it was good as we planned our trip back to Dallas for 6 am the next day.

In conclusion I would like to say that we had an amazing time in Lubbock with great people and at an incredible campus. All students and professors took really good care of us. The number of German students who took part in this excursion that would like to come back for Master Studies at Texas Tech has increased because of the fantastic time.

Metropolitan Transportation Authority in Manhattan

Johannes Rudolph

On the 18th of September we went to the New York Metropolitan Transportation Authority. Sophia-LaFrance Brooks welcomed us. She gave us a lot of information materials. After a short visit of the New York Transit Museum and the Apple Store at Grand Central Terminal, Christian F. Bastian, Senior Manager Transportation System Research Planning Division gave us an overview about the MTA. He started his presentation with the history of the MTA.



In 1967, the MTA was established to coordinate public transportation throughout the metropolitan area, merging failed private companies and independent public agencies to produce a coordinated region-wide public transportation system.

He explained something about the actual situation and informed us about some future projects. Today the MTA is splitted in five operating Agencies:

- New York City Transit
- MTA Bus Company
- Long Island Rail Road
- Metro-North Railroad
- MTA Bridges and Tunnels



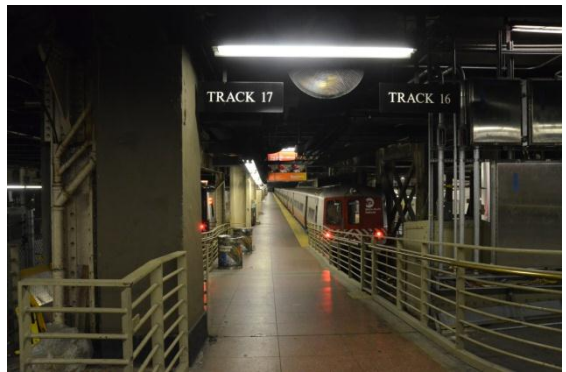
From 2010 to 2014 the MTA have an Investment Program about \$10.5 billion. They invest \$1 billion in new Rolling Stock and \$1.4 billion for replacing 56.5 miles of their tracks. For Signals & Communication they want to invest \$3.192 billion. One part is a Real-Time information System for the Customers, so they can get Real-Time information on their smart phones.



The MTA tries not to close a Subway line for some weeks; they renew their tracks mostly in the night when there is not so much traffic.

After his presentation we had a subsequent discussion.

At 11:30 am we met George Monasterio (Chief Architect Capital Engineering) and James J. Hoegler (Project Manager Long Range Planning Division) in the Main Hall of the Grand Central Terminal. We got a special view from the amazing building during a conducted tour. He told us something about the History and the big renovation in 1998. We also saw the control center for the rail tracks, which are coming into the Grand Central Terminal. Something unique in the Grand Central Terminal is the Tennis court over the old waiting hall. In the past the Grand Central Terminal was air-conditioned by the windows in the west and the east, because between the East River and the Hudson River is a breeze anytime. Today the Grand Central Terminal has an air-conditioning system and all Windows are closed. At the End of our Tour we visited the Lost and Found Office. A member of the staff told us about the operational sequences. Nearly 80% of the lost property is collected by their owners.



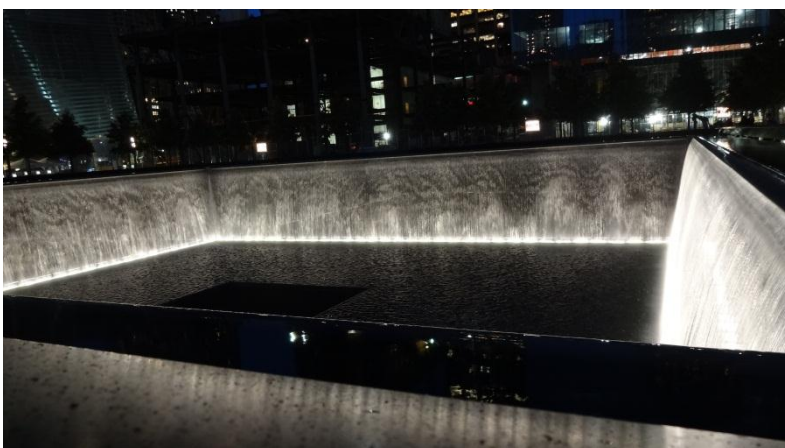
James J. Hoegler and Janek Kozlowski (District Superintendent & Project Coordinator ESA) gave us a chance to look at the construction area of the new East Side Access. 6 students saw this amazing construction area. The East Side Access is designed to bring the Long Island Rail Road into Grand Central Terminal. It is expected to be operational by 2019. Janek Kozlowski explained us the construction area and he also gave us some important tips for our time when we will be engineers.



The Rest of the Group visited the Museum of Modern Arts. It has been important in developing and collecting modernist art, and is often identified as the most influential museum of modern art in the world.



In the Evening we all went to the 9/11 Memorial. The 9/11 Memorial is the principal memorial and museum commemorating the September 11 attacks of 2001, which killed approximately 3,000 people, and the World Trade Center bombing of 1993, which killed six. The memorial is located at the World Trade Center site, on the former location of the Twin Towers destroyed during the attacks.



Last day in New York

This is a report of my last day in N.Y.

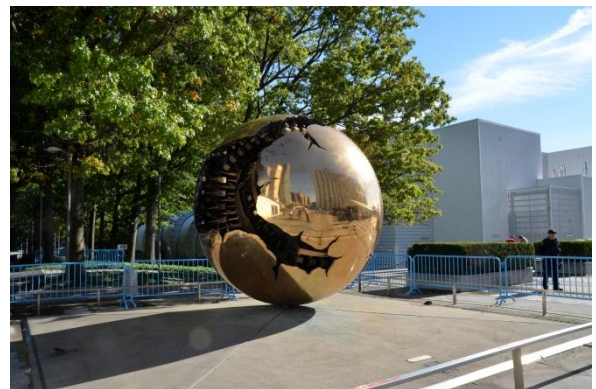
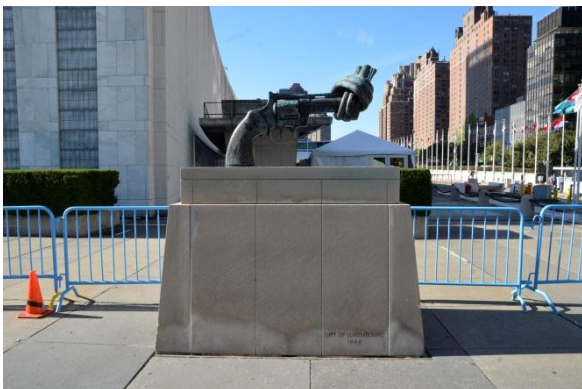
For me all experiences were unique. I will try to describe this event.

The day began with a modest breakfast (as usual in America).

Then our group went to the DAAD (German Academic Exchange Service).

At first we went by subway, afterwards by feet.

We passed the UN Building where a few days later the UN General Assembly 2012 started.



DAAD New York

It was a great welcome at the DAAD. We started with a detailed presentation of the DAAD about their work, structures and activities. DAAD is funding trips for German people as well as for foreigners travelling to Germany. This is financed mostly from Government funds.

Peter R. Kerrigan from German Academic Exchange Service gave us an overview of their support programs in Canada and the USA. Those programs are in demand by many students. Typical are one-year-programs and the requirements are very high. Excellent grades and a selection interview with the applicants are necessary. The financial support includes costs for Flight, living costs and study fees.

There are 36 Foreign Offices of the DAAD worldwide providing 55.000 scholarships in a year and taking care of the "Erasmus-Program".

The DAAD is divided into 5 major areas of activity. 68 Million € are provided for scholarships of foreigners, 60 Million € for the internationalization of universities and 83 Million € for German scholarships. 37 Million € are devoted to the promotion of the German language and 51 Million € are invested in development working.



After that presentation Mr Lübben and Mr Beckmann explained the intentions of our group excursion and the collaboration between Jade Hochschule and Texas Tech University.

Dr. Kim Sims from UAS7 office described the work of the UAS7 especially in New York. UAS7 e. V. is a consortium of seven discovery-led universities of applied sciences with a strong international orientation. With

the maxim “together we are strong” those very different universities of applied sciences from Hamburg, Berlin, Bremen, Cologne Munich, Münster and Osnabrück keep that collective liaison office since 2005 as an strategy alliance in New York. Dr. Sims said that UAS7 is open to support other universities of applied sciences to get in contact with educational institutions in the USA.



New York Impressions

The time before this day our group visited different attractions of New York. The next should be the “Rockefeller Centre”. I shot nearly 5000 photos, of course not all shown in this report. I think I`ll have chosen the right ones. Look at the view from the Rockefeller Centre (Must surely not describe what I felt in this moment!).



Don`t remember how long we stayed up there, but I`ll never forget that moment, just closed my mouth and only enjoyed!

Next stop on our tour was the USS Intrepid. That was really amazing (In Germany you would say “der absolute hammer”).

The USS Intrepid is one of the first aircraft carriers that took part in World

War 2, in the Vietnam War and rescued space capsules. Since the 70`s it is a museum lying at anchor at Manhattan on the Hudson river.

All this pleasure will cost 30 Dollars depending on whether you want to look at the Space Shuttle “Enterprise” in a hangar on deck or not. Also in this ticket is included a tour in a submarine of WW2. It is a big larger than the U34 in Bremerhaven and was one of the first that had ballistic missiles on board. Various original helicopters, airplanes, jets, space capsules etc. can be seen on and below deck. My personal highlights were the Blackbird engines almost as long as a complete F16!



Now I`m sitting here and try to imagine how much time we`ve spent to visit the different places. I was so surprised how much amazing buildings, surroundings and historical places we have seen in a day ... and then the speedboat event! Great music, super speed and a super fun crew!



Should you ever decide to go to N.Y. you must visit the Intrepid and then you should make the boat tour. So you can experience two “sau-cool” events in a time.

At last we made our way to the Madison Square Garden, connected with the Pennsylvania Station.

Before the start of our farewell evening we decided to go to the Rail Walk. It is an old train line which was abandoned, but a very nice walkway created with generous plantings.

Then the night program began. The members of our group met at 21.00 at a nice Italian restaurant.

We were eating fine taking care for the depletion of the stock of the house wine.

The next stop was a cool Irish Pub. At this time Tanja, Lasse and I decided to separate from the group because the majority wanted to go to the Empire Building. Since we had been on the "Top of the Rock", we (Tanja, Lasse and me) decided to explore as much various bars as possible.

This was one of the best decisions forever!

Surely I could write much about this cool party night or at least philosophize about the unknown parts. But I think it would be better that it's a part of our memory.

I've seen a lot on this trip, learned a lot, experienced a lot and made a little bit too much party (which is normally not possible) but the most important thing: I learned to know 14 previously unknown people which I will never forget.

See you

William



Teilnehmerliste

Folker	Renken
Volker	Lübben
Paul	Beckmann
Marvin	Bunjes
Wilhelm	Eickhoff
Patrick	Gerdes
Alexandra	Gerling
Denis	Juschanin
Lasse	Maaß
Janko	Moritz
Tanja	Müssing
Linus	Pohle
Johannes	Rudolph
Sascha	Schneider
Michael	Strutz

Collage

