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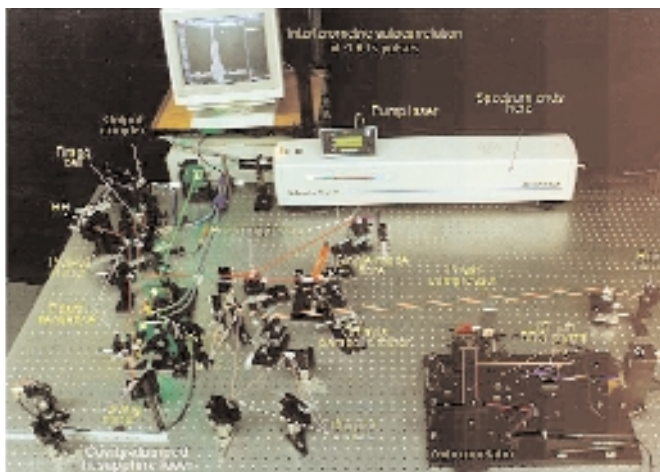
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Studying chemical reactions with the fastest lasers in the world

Chemical equations seem to suggest that we know more about chemical reactions than is really the case. After all, what happens exactly in the instance when a reaction takes place is something that we can still only guess at. Recent developments in scientific research are changing this lack of knowledge. State-of-the-art ultrafast lasers enable us to follow reactions step by tiny step. In 1999, Egyptian scientist Prof. Zewail (1946) was awarded the Nobel Prize for his development of and research with these extremely fast instruments. The fastest laser in the world is situated at the Material Science Center in Groningen.

"What would a football match on TV be without 'slow motion' revealing afterwards the movements of the players and the ball when a goal is scored?" Thus begins the explanation of Zewail's research by The Royal Swedish Academy of Sciences. "Chemical reactions are a similar case. The chemists' eagerness to be able to follow chemical reactions in the greatest detail has prompted increasingly advanced



A laser at the university of Groningen (Cavity-dumped Ti:sapphire laser).

technology. This year's laureate in Chemistry, Ahmed H. Zewail, has studied atoms and molecules in 'slow motion' during a reaction and seen what actually happens when chemical bonds break and new ones are created."

[See next page >>](#)

Dear competitors and other guests,

Some years ago, I was present at the finals of the National Chemistry Olympiad in the Netherlands. I was struck by the contagious enthusiasm of the contestants, which they managed to convey to the scientists and university administrators who were also present. During the prize-giving ceremony, I discussed this with Douwe Wiersma, Dean of the Science Faculty of the University of Groningen, and Eric Bleumink, at the time chairman of the University Executive Board. They agreed with me that the International Chemistry Olympiad should some day be organized in Groningen.

And now this wish has come true, and the Olympiad is about to begin. I am thrilled by the prospect. The organization proved a huge effort, but I am convinced that this Olympiad will be a great success.

An event like the International Chemistry Olympiad is extremely valuable for the internationalization of science. Even before attending university, the Olympiad students will interact with an international forum. Furthermore, it will show them that competition also has a place within science, and that competitive challenges may very well occur outside the domain of sports, in the head, with

experimental skills, craftsmanship, and manual and mental dexterity.

I hope all competitors will enjoy an inspired and pleasant contest and, most of all, a good introduction to the Netherlands, to the University of Groningen, and to the city of Groningen and its Ommelanden region. I also hope that everyone, be they competitors, mentors or other guests, will strike up many and lasting international friendships at this 34th International Chemistry Olympiad. Experience shows that this is usually no problem at all.

Enjoy the entire program!



Prof. Jan H. Teuben
(Member of
the Organizing Committee)

>> The fastest laser

The technology developed by Prof. Zewail in the late 1980s resembles a wickedly fast movie camera that uses extremely fast laser pulses. Speed is important here, because the shorter the shutter speed, the more details the camera will capture. The shutter speed of a fast but ordinary camera may be as short as 0.00025 seconds, while the "shutter speed" of the lasers is in the range of femtoseconds. A femtosecond (fs) is 10^{-15} second, i.e. 0.000000000000001 second. The name of the field opened up by Zewail's research therefore became "femtochemistry."

Limit

In order to observe the details of a chemical reaction with the camera, two substances are mixed in a vacuum chamber. Then, an ultrafast laser injects two pulses: first, a powerful pump pulse that strikes the molecule and excites it to a higher energy state. This pump pulse initiates the reaction, as it were. After the pump pulse follows the probe pulse, at a wavelength selected to detect the original molecule or an altered form of this molecule. The probe pulse examines what is happening. By varying the time interval between the two pulses, it is possible to see how quickly the original molecule has been transformed. The interval between the laser pulses may be shorter than the time required for an atom to make a single vibration. It usually takes an atom 10 to 100 fs to do so. We have thus reached a limit, concluded the Nobel Prize committee, because no chemical reaction can proceed faster than the time an atom needs for one vibration.

The development of femtochemistry has already led to the discovery of substances found in the reaction process from one product to the next; these substances are called intermediates. These intermediates, whose lifespan is usually extremely brief, form the pieces of the puzzle we need to understand how a chemical reaction works.

Groningen

The University of Groningen also has a femtochemistry research group, led by Prof. Koos Duppen and Dr Maxim Pshenichnikov. The Dean of the University, Prof. Douwe Wiersma, has also contributed to this research. As a post-graduate researcher, he worked with Nobel laureate Zewail. The researchers in Groningen are well equipped. They even have the fastest lasers in the world at their disposal. With the test setup in the picture, the Groningen scientists have produced laser pulses of 4.5 fs.

Roughly speaking, the Groningen research is split up into a "Physics" and a "Biology" branch. The Physics branch



Prof. Zewail

studies the ultrafast dynamics of molecules in liquids, for example by disturbing the equilibrium of a molecule in a liquid with a laser pulse and then using a whole series of short laser pulses to observe how this molecule or its environment returns to the rest state.

The Biology branch uses lasers and an extremely high-resolution microscope to study biological samples. One of the projects investigates the distribution and transport of water in living cells. It studies how cells respond to changes in osmotic conditions. Cells use a sophisticated system of active pumps and storage facilities for this purpose. The system is studied by exposing certain cells to a sudden change in the watery environment, for example by rapidly replacing H₂O with D₂O.

These are only a few examples of the ongoing research in femtochemistry. Now that chemical reactions no longer occur in an invisible domain, this field of research has witnessed an explosive development. And who knows what other developments this may lead to? "With the world's fastest camera available, only the imagination sets bounds for new problems to tackle," stated the Nobel Prize committee.

Some of the material in this article had been taken from the 1999 Nobel Prize in Chemistry press release.

**Tomorrows program****Saturday 06 July 2002****MENTORS / SCIENTIFIC OBSERVERS**

11:00 Opening Ceremony at Martinikerk
 13:00 Lunch at Academiegebouw
 14:00 Inspection of Laboratories
 15:00 Departure for It Wiid (hotel)
 17:00-18:00 Consultation with authors
 19:00 Dinner at hotel
 20:00-24:00 First Jury Meeting

STUDENTS

11:00 Opening Ceremony at Martinikerk
 13:00 Lunch at Academiegebouw
 14:00 Departure for hotel Zuidbroek
 18:00 Dinner at hotel
 20:00-23:00 Social evening

GUESTS

11:00 Opening Ceremony at Martinikerk
 13:00 Lunch at Academiegebouw
 14:00-17:00 City tour Groningen
 17:00 Departure for It Wiid
 19:00 Dinner at It Wiid

Thursday 4 July: A visit to the hosts

Behind the scenes: Van der Valk, Zuidbroek



The hosts have occupied the Van der Valk hotel in Zuidbroek and have made a cursory inspection before the participants arrive: first of the quality of the typically Dutch dinner (Dutch stew with smoked sausage) and then of the swimming pool. Both were given the OK, and the participants are encouraged to make good use of both!

Let's see who some of these hosts are:



Ron Oren, Renze Feitsma, Edwin Otten, and Esther Vertelman have spent the first evening with a few no-holds-barred games of 'klaverjas' (a Dutch card game).

Ron Oren is a driver for the Olympiad. He will take care of transportation the entire week. Getting up tomorrow: at 6.30 a.m.; his expectations of the Olympiad: an enjoyable week full of (international) humor.

Renze Feitsma will celebrate his birthday on the closing day of the Olympiad (i.e. 13 July) and expects that by then his Irish team will have told him all there is to know about their country. He has never been there, you see (e.g. for a holiday) and so he depends on the group he is hosting to fill in the details. Getting up tomorrow: at 4.45 a.m.; he will then quickly go to Schiphol Amsterdam Airport to welcome and assist arriving delegations all day long. Renze was himself an IChO participant two years ago; he represented the Netherlands in Denmark.

Edwin Otten's main interest in the week is not chemistry but satisfying international contacts. He volunteered after he had seen a poster on a wall at the University.

These posters had been put up there by **Esther Vertelman**, the host coordinator. When putting them up, she got excited herself, and joined the Olympiad support team. She misses the tiger print sheets that she had rather expected in this extraordinary hotel room, she explains given the rest of the interior.

But for tiger prints, she can go to her neighbor, **Danièle Gibney**, who has just returned from the swimming pool and is all set to welcome her Australian team.



Chris Dams was a participant in the 1994 and 1995 National Chemistry Olympiads and therefore went to China for the International Chemistry Olympiad. He expects to meet a lot of people he met in those days and of course to have a swell time!



Albert de Graaf has just returned from the local Aldi supermarket with a packed breakfast. He will also get up at 5.00 a.m. tomorrow, also for a day at Amsterdam Airport to welcome delegations. He participated in the 2000 Olympiad in Copenhagen and has therefore volunteered. With his command of French, he will surely get the best of the French group assigned to him, but it will also be good conversation practice. He hopes the pleasant atmosphere among the hosts will quickly infect the whole group (students and hosts) and looks forward to for a violent chemical reaction between all people involved in the Olympiad.

FAMILYNAME	INITIALS	SEX	CATEGORY	COUNTRY
OLABE	J.A.	M	HEAD MENTOR	ARGENTINA
BONESI	S.M.	M	MENTOR	ARGENTINA
SCIENTIFIC OBSERVER		M	SCIENTIFIC OBSERVER	ARGENTINA
NUÑEZ	P.	M	STUDENT	ARGENTINA
ABERBUJ	P.	M	STUDENT	ARGENTINA
SALIERNO	G.	M	STUDENT	ARGENTINA
CORDONE	M.	M	STUDENT	ARGENTINA
GRUMMITT	A.	F	HEAD MENTOR	AUSTRALIA
WALLIS	T.	M	MENTOR	AUSTRALIA
SALEM	G.	M	SCIENTIFIC OBSERVER	AUSTRALIA
TILDEN	A.	F	GUEST	AUSTRALIA
TENG	G.	M	STUDENT	AUSTRALIA
THORN-SESHOLD	O.	M	STUDENT	AUSTRALIA
SALMAN	S.	M	STUDENT	AUSTRALIA
WONG	A.	M	STUDENT	AUSTRALIA
ALSFORD	M.	M	GUEST	AUSTRALIA
KERSCHBAUMER	M.	M	HEAD MENTOR	AUSTRIA
BERNER	L.	F	MENTOR	AUSTRIA
KOLLER	D.	M	STUDENT	AUSTRIA
LUDL	P.	M	STUDENT	AUSTRIA
STECHER	T.	M	STUDENT	AUSTRIA
THALHAMMER	A.	M	STUDENT	AUSTRIA
AKYOL	A.	M	SCIENTIFIC OBSERVER	AZERBAIJAN
ABBASOV	V.	M	HEAD MENTOR	AZERBAIJAN
ABBASOV	M.	M	MENTOR	AZERBAIJAN
CAVADOV	A.	M	STUDENT	AZERBAIJAN
HEYBATOV	E.	M	STUDENT	AZERBAIJAN
DAVUDOV	D.	M	STUDENT	AZERBAIJAN
MUSAYEV	O.	M	STUDENT	AZERBAIJAN
KHVALYUK	V.	M	HEAD MENTOR	BELARUS
VORONKOVA	E.	F	MENTOR	BELARUS
PUTAU	A.	M	STUDENT	BELARUS
MENSHYKAU	D.	M	STUDENT	BELARUS
PIATKEVICH	K.	M	STUDENT	BELARUS
ZHDANKO	A.	M	STUDENT	BELARUS
JANSSENS	H.	F	HEAD MENTOR	BELGIUM
MERCINY	L.	F	MENTOR	BELGIUM
IDCZAK	J.	M	SCIENTIFIC OBSERVER	BELGIUM
VERCAUTEREN	D.	M	STUDENT	BELGIUM
TASSIN	C.	M	STUDENT	BELGIUM
JOTTRAND	L.	M	STUDENT	BELGIUM
COLLIGNON	M.-L.	F	STUDENT	BELGIUM
MAIA MELO	S.	M	HEAD MENTOR	BRAZIL
DANTAS LOPES	J.A.	M	MENTOR	BRAZIL
OLIVEIRA	A.	M	SCIENTIFIC OBSERVER	BRAZIL
SOUZA CARVALHO MELO	L.	F	SCIENTIFIC OBSERVER	BRAZIL
TAJRA FONTELES	R.	M	STUDENT	BRAZIL
SAMMUEL COSTA DE MO	Y.	M	STUDENT	BRAZIL
PEREIRA SARAIVA	J.	M	STUDENT	BRAZIL
MAIA DE OLIVEIRA	A.	M	STUDENT	BRAZIL
PEKOV	G.	M	HEAD MENTOR	BULGARIA
IEIEV	I.	M	MENTOR	BULGARIA
SHUSHKOV	F.	M	STUDENT	BULGARIA
PASHOV	D.	M	STUDENT	BULGARIA
BELEZHANSKA	Y.	F	STUDENT	BULGARIA
IVANOV	D.	M	STUDENT	BULGARIA
BATES	G.	M	HEAD MENTOR	CANADA
FILTEAU	C.	F	MENTOR	CANADA
HONG	L.	M	STUDENT	CANADA
KIM	J.H.	M	STUDENT	CANADA
TSENG	W.L.	M	STUDENT	CANADA
YEUNG	S.H.	M	STUDENT	CANADA
DUAN	L.	M	HEAD MENTOR	CHINA
CHEN	D.	M	MENTOR	CHINA
PEI	J.	M	SCIENTIFIC OBSERVER	CHINA
WANG	F.	M	STUDENT	CHINA
ZHU	Y.	M	STUDENT	CHINA
LIU	W.	M	STUDENT	CHINA
LU	H.	M	STUDENT	CHINA
ZHAO	H.	M	GUEST	CHINA
ZORC	B.	F	HEAD MENTOR	CROATIA
KRONJA	O.	F	MENTOR	CROATIA
FRANJE	N.	M	STUDENT	CROATIA
KASSAL	I.	M	STUDENT	CROATIA
CORIE	I.	M	STUDENT	CROATIA
KOLUNDEIE	F.	M	STUDENT	CROATIA
GUERRA CASTAÑO	L.	M	HEAD MENTOR	CUBA
ALFONSO VALDÉS	R.	M	MENTOR	CUBA
PÚREZ BARZAGA	V.	M	STUDENT	CUBA
HERNÁNDEZ GONZÁLEZ	J.E.	M	STUDENT	CUBA
BRAVO RODRÍGUEZ	K.	M	STUDENT	CUBA
GONZÁLEZ VALDÉS	I.B.	F	STUDENT	CUBA

NICOLAOU	M.	M	HEAD MENTOR	CYPRUS
ANASTASIADOU	L.	F	MENTOR	CYPRUS
NICOLAIDIS	C.	M	STUDENT	CYPRUS
KOUPPARIS	K.	M	STUDENT	CYPRUS
VOLOS	S.	M	STUDENT	CYPRUS
MATSIKARIS	K.	M	STUDENT	CYPRUS
SEJBAL	J.	M	HEAD MENTOR	CZECH REPUBLIC
SLAVICEK	P.	M	MENTOR	CZECH REPUBLIC
PLUHAROVÁ	E.	F	STUDENT	CZECH REPUBLIC
DRAHOS	B.	M	STUDENT	CZECH REPUBLIC
CHUDOBA	R.	M	STUDENT	CZECH REPUBLIC
MIKULKA	T.	M	STUDENT	CZECH REPUBLIC
NIELSEN	K.B.	M	HEAD MENTOR	DENMARK
JESPERGAARD	P.	M	MENTOR	DENMARK
ANTHON	C.	M	SCIENTIFIC OBSERVER	DENMARK
KRISTIANSEN	M.	M	STUDENT	DENMARK
LAURIDSEN	T.	M	STUDENT	DENMARK
ERSBAK BANG NIELSEN	A.	F	STUDENT	DENMARK
WALDORFF	D.	F	STUDENT	DENMARK
HELAL	A.	M	MENTOR	EGYPT
HASSAN	S.	M	HEAD MENTOR	EGYPT
FARAG	A.	M	SCIENTIFIC OBSERVER	EGYPT
ZHRAN	N.	F	STUDENT	EGYPT
ABD-ELMALCK	M.	F	STUDENT	EGYPT
SOUBIH	A.	M	STUDENT	EGYPT
YEHYA	A.	M	STUDENT	EGYPT
GABR	R.	M	GUEST	EGYPT
ABD-ELMONEIM	Y.	M	GUEST	EGYPT
PULLERITS	R.	M	HEAD MENTOR	ESTONIA
MÄEORG	U.	M	MENTOR	ESTONIA
STARKOV	P.	M	STUDENT	ESTONIA
IVANISTSEV	V.	M	STUDENT	ESTONIA
TAMJAR	E.	F	STUDENT	ESTONIA
KARUS	S.	M	STUDENT	ESTONIA
NÄSÄKKÄLÄ	M.	M	HEAD MENTOR	FINLAND
KOSKIMIES	J.	M	MENTOR	FINLAND
MONTONEN	M.	F	SCIENTIFIC OBSERVER	FINLAND
JÄRVINGEN	T.	M	STUDENT	FINLAND
KANGASNIGMI	T.	M	STUDENT	FINLAND
RASALA	T.	M	STUDENT	FINLAND
VALKAMA	P.	M	STUDENT	FINLAND
BERNARD	M.	M	HEAD MENTOR	FRANCE
SCHILTZ	S.	F	MENTOR	FRANCE
PLAIDY	O.	M	SCIENTIFIC OBSERVER	FRANCE
BOCQUET	A.	M	STUDENT	FRANCE
CARTIGNY	D.	M	STUDENT	FRANCE
MANSERAND	B.	M	STUDENT	FRANCE
SCHILTZ	S.	M	STUDENT	FRANCE
HAMPE	W.	M	HEAD MENTOR	GERMANY
BARK	T.	M	MENTOR	GERMANY
KLUEPFEL	S.	M	STUDENT	GERMANY
LEDOCHO-WITSCH	P.	M	STUDENT	GERMANY
PLATE	L.	M	STUDENT	GERMANY
RODENBERG	A.	M	STUDENT	GERMANY
TSATSAS	A.	M	HEAD MENTOR	GREECE
CHINIADES	D.	M	MENTOR	GREECE
KORDONIS	I.	M	STUDENT	GREECE
THEODORO-POULOU	S.	F	STUDENT	GREECE
MARINO-POULOS	K.	M	STUDENT	GREECE
MOUSTAKAS	N.	M	STUDENT	GREECE
KOINIS	S.	M	SCIENTIFIC OBSERVER	GREECE
PSAROUDADIS	N.	M	SCIENTIFIC OBSERVER	GREECE
SALTA	K.	F	SCIENTIFIC OBSERVER	GREECE
BAKOGIANNIS	C.	M	SCIENTIFIC OBSERVER	GREECE
MAGYARFALVI	G.	M	HEAD MENTOR	HUNGARY
KÓCZÁN	G.	M	MENTOR	HUNGARY
VILLÁNYI	A.	M	SCIENTIFIC OBSERVER	HUNGARY
SZALAY	Z.	F	STUDENT	HUNGARY
BALOGH	J.	M	STUDENT	HUNGARY
PARAZS	D.	M	STUDENT	HUNGARY
BEIN	M.	M	STUDENT	HUNGARY
BJÖRGVINSSON	M.	M	HEAD MENTOR	ICELAND
OSKARSSON	S.	M	MENTOR	ICELAND
JÓNSSON	E.	M	STUDENT	ICELAND
FLOSADÓTTIR	H.D.	F	STUDENT	ICELAND
ÓMARSÓTTIR	L.Ó.	F	STUDENT	ICELAND
SIGHVATSSON	H.	M	STUDENT	ICELAND
FLOSADÓTTIR	A.	F	OUTSIDER	ICELAND
VANKAR	Y.D.	M	HEAD MENTOR	INDIA
PRABHU	D.	M	MENTOR	INDIA
KRISHNAN	A.	M	STUDENT	INDIA
DEWANI	S.	M	STUDENT	INDIA
SHIVARAMAN	S.	M	STUDENT	INDIA
KUMAR	S.	M	STUDENT	INDIA
SIHOMBING	R.	M	HEAD MENTOR	INDONESIA
FRANISAL	N.	M	MENTOR	INDONESIA

MOENANDAR	I.	M	SCIENTIFIC OBSERVER	INDONESIA
ZAMRONI	M.	F	GUEST	INDONESIA
ABDILLAH	P.A.	M	STUDENT	INDONESIA
JIMRON	B.	M	STUDENT	INDONESIA
SALIM	T.	M	STUDENT	INDONESIA
TAUFIQURROHMAN	M.F.	M	STUDENT	INDONESIA
ABEDINI	M.	M	HEAD MENTOR	IRAN
KIANI	R.	M	MENTOR	IRAN
TORABI	N.	F	STUDENT	IRAN
AQAIARY	J.	M	STUDENT	IRAN
SHAHI	M.	M	STUDENT	IRAN
SHIRDEL	M.	M	STUDENT	IRAN
SEYEDI ESFAHANI	S.	M	SCIENTIFIC OBSERVER	IRAN
GABEL RAHMAT	A.	F	OUTSIDER	IRAN
JAMES	P.	M	HEAD MENTOR	IRELAND
BROWNE	W.	M	MENTOR	IRELAND
TONER	D.	F	STUDENT	IRELAND
MALOFFEEV	V.	M	STUDENT	IRELAND
MC GEE	P.	F	STUDENT	IRELAND
MAC NAMARA	M.	M	STUDENT	IRELAND
ANASTASIA	M.	M	HEAD MENTOR	ITALY
GORI	S.	M	MENTOR	ITALY
ROSI	G.	M	STUDENT	ITALY
DI ANTONIO	M.	M	STUDENT	ITALY
CREATI	F.	M	STUDENT	ITALY
CERICOLA	D.	M	STUDENT	ITALY
BAMBA	E.	M	SCIENTIFIC OBSERVER	IVORY COAST
DION	M.	M	SCIENTIFIC OBSERVER	IVORY COAST
MORI	A.	M	SCIENTIFIC OBSERVER	JAPAN
ITO	M.	M	SCIENTIFIC OBSERVER	JAPAN
NODA	Y.	M	SCIENTIFIC OBSERVER	JAPAN
MENDIGALIYEVA	S.	F	HEAD MENTOR	KAZAKHSTAN
BEKISHEV	K.	M	MENTOR	KAZAKHSTAN
NURTAZIN	A.	M	STUDENT	KAZAKHSTAN
NURGABDESHOV	A.	M	STUDENT	KAZAKHSTAN
ISKAKOV	A.	M	STUDENT	KAZAKHSTAN
TULEBEKOV	Y.	M	STUDENT	KAZAKHSTAN
KIM	H.	M	HEAD MENTOR	KOREA
SHIN	S.	M	MENTOR	KOREA
LEE	D.	M	SCIENTIFIC OBSERVER	KOREA
MOON	H.J.	M	SCIENTIFIC OBSERVER	KOREA
KIM	M.H.	M	STUDENT	KOREA
KIM	I.S.	M	STUDENT	KOREA
LEE	J.H.	M	STUDENT	KOREA
KIM	Y.J.	M	STUDENT	KOREA
HWANG	J.Y.	M	SCIENTIFIC OBSERVER	KOREA
KIM	S.J.	M	SCIENTIFIC OBSERVER	KOREA
HADI	B.	M	HEAD MENTOR	KUWAIT
ABDULLAH	A.	F	MENTOR	KUWAIT
ALJASSAR	F.	M	STUDENT	KUWAIT
ABDULJABAR / ALFELA	R.	F	STUDENT	KUWAIT
BARON	F.	F	STUDENT	KUWAIT
ALHASAN	L.	F	STUDENT	KUWAIT
ALEBRAHEM	A.	F	SCIENTIFIC OBSERVER	KUWAIT
ABDAL	F.	M	GUEST	KUWAIT
ATTALLAH	S.	M	GUEST	KUWAIT
KOSOBAYEVA	B.	F	HEAD MENTOR	KYRGYZSTAN
JUSAEVA	S.	F	MENTOR	KYRGYZSTAN
AMATOV	T.	M	STUDENT	KYRGYZSTAN
JUMBAEV	S.	M	STUDENT	KYRGYZSTAN
ESTEBESOV	E.	M	STUDENT	KYRGYZSTAN
SABYROV	K.	M	STUDENT	KYRGYZSTAN
PAKULE	S.	F	HEAD MENTOR	LATVIA
GIBIETIS	J.	M	MENTOR	LATVIA
STUDENT1		M	STUDENT	LATVIA
STUDENT2		M	STUDENT	LATVIA
STUDENT3		M	STUDENT	LATVIA
STUDENT4		M	STUDENT	LATVIA
BUTKUS	E.	M	HEAD MENTOR	LITHUANIA
RAUDONIS	R.	M	MENTOR	LITHUANIA
BACELIS	J.	M	STUDENT	LITHUANIA
BAGDZIUNAS	G.	M	STUDENT	LITHUANIA
TAMOSIUNAS	P.	M	STUDENT	LITHUANIA
KUBILIUS	J.	M	STUDENT	LITHUANIA
DOMINGUEZ	R.	M	HEAD MENTOR	MEXICO
LEON	F.	M	MENTOR	MEXICO
CASTRO	C.	M	SCIENTIFIC OBSERVER	MEXICO
YUEN ZHOU	J.	M	STUDENT	MEXICO
JIMÉNEZ HOYOS	C.A.	M	STUDENT	MEXICO
MÁRQUEZ SALCEDO	A.	F	STUDENT	MEXICO
DÍAZ TINOCO	M.A.	M	STUDENT	MEXICO
TUMUROCHIR	D.	M	SCIENTIFIC OBSERVER	MONGOLIA
GAST 1		M	GUEST	MONGOLIA

KLEIJN	E.H.M.H. DE	M	HEAD MENTOR	NEDERLAND
BROENS	J.B.	M	MENTOR	NEDERLAND
MOONS	H.	M	STUDENT	NEDERLAND
CNOSEN	A.	M	STUDENT	NEDERLAND
GROOTE	R.	M	STUDENT	NEDERLAND
ROSENTHAL	A.	M	STUDENT	NEDERLAND
NGUYEN VIET	C.	M	STUDENT	NEDERLAND
MACLAGAN	R.	M	HEAD MENTOR	NEW ZEALAND
BONIFACE	S.	F	MENTOR	NEW ZEALAND
WOODGATE	S.	F	SCIENTIFIC OBSERVER	NEW ZEALAND
LAU	P.	M	STUDENT	NEW ZEALAND
MASON	G.	F	STUDENT	NEW ZEALAND
PENG	K.	M	STUDENT	NEW ZEALAND
YEUSLEY	A.	M	STUDENT	NEW ZEALAND
IMADE	K.N.	M	SCIENTIFIC OBSERVER	NIGERIA
FURUETH	S.	F	HEAD MENTOR	NORWAY
STORM	B.	F	MENTOR	NORWAY
MABERG	O.	M	SCIENTIFIC OBSERVER	NORWAY
FORLAND	M.	F	STUDENT	NORWAY
LINDSTROM	C.	F	STUDENT	NORWAY
LUDVIGSEN	M.	F	STUDENT	NORWAY
VESTLI	K.	M	STUDENT	NORWAY
GHONG	M.	M	SCIENTIFIC OBSERVER	PERU
MIZERSKI	T.	M	HEAD MENTOR	POLAND
ORLIK	M.	M	MENTOR	POLAND
SKOMOROWSKI	W.	M	STUDENT	POLAND
KARBOWNIK	M.	M	STUDENT	POLAND
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