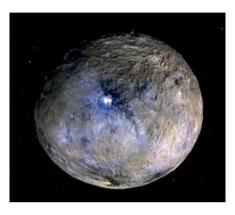
Max Planck RESEARCH



The Science Magazine of the Max Planck Society 2.2016





Successful shots: Images from special cameras reveal the secrets of Ceres, a dwarf planet.



Shrinking polar cap: Measurements in the Arctic explain the rapid melting of the sea ice.

•••••



Popular analyses: Ayelet Shachar researches the legal aspects of the refugee crisis.

••••••

SPECTRUM

- Extreme Energy Source at the Heart of the Milky Way
- 42 **Blood Test for Tuberculosis**
- 43 Compass in the Eye
- Extortioners at the Negotiating Table 43
- Animation Made Easy 44
- A Hammer for Molecule Swapping 44
- Cuddle Hormone Relieves Pain
- 45 Testing the Response Time of Electrons
- Immune Genes from Neanderthals
- 46 Dark Taiga Lightens Up
- Speedy Birth of a Planet
- 47 Ciliates as Models
- Hardship Increases Risk-Taking in Old Age
- Fighting for the Host 47

MATERIALS & TECHNOLOGY

A Trio with an Extensive Repertoire

Technological advances are frequently possible only with the development of new materials. This is true whether we are talking about energy supply or information technology. Heusler compounds are a rich source of new materials.

PHYSICS & ASTRONOMY

56 A Dark World of Ice

A space probe has journeyed to Ceres for the first time. Scientists are using its two onboard cameras to explore the dark surface of the dwarf planet. They have already discovered signs of frozen water but is there also an ocean slumbering deep below the craters?

ENVIRONMENT & CLIMATE

62 Thaw in the Climate Model

Nowhere does climate change make its presence felt more strongly than in the Arctic. The volume of sea ice there has fallen drastically in recent decades. What processes influence the formation and melting of this ice?

CULTURE & SOCIETY

Mediator between Worlds

Personal Portrait: Ayelet Shachar

REGULAR FEATURES

- 03 On Location
- 16 Post to - Calcutta, India Education is a Valuable Commodity
- Flashback 78 Hunting for Particles Underground
- ጸበ **Max Planck Community**
- New Open Access Initiative Launched
- Kick-off for Cooperation in Hong Kong
- 81 Alumni Symposium Holds Premiere in Berlin
- 82 Diverse Objectives - Diverse Careers
- 83 **Research Establishments**
- **Publisher's Information**

Mediator between Worlds

Avelet Shachar wanted to be an architect. She wanted to create spaces and provide homes for people. As a lawyer and political scientist, however, she discovered the spaces of the law - and the possibilities they provide for enabling migrants and locals to find ways of living together. Every community, says the Director at the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen, needs the discourse about aims and identity. And every individual has the right to participation and a home.

TEXT MARTIN TSCHECHNE

rchitecture seems like an obvious place to start. To accommodate the new colleague, a story was added on to the rather simple building that stands opposite the beautiful art nouveau villa where the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen is based. Finishing plaster still crunches underfoot up there, and desks, computer monitors, corner seating, conference rooms and coffee machines have yet to transform the snowwhite suite of rooms into a workplace. Not a single book stands in Ayelet Shachar's bookshelves yet.

It's a spring day in 2016. Every impression is a mere snapshot, of course this one, too. The boxes from Toronto will be unpacked soon, the books arranged, and colleagues will have furnished their rooms upstairs. Today more than ever, perhaps, this kind of insight plays a role in the work and stud-

ies of Professor Shachar, who was born in Jerusalem: time is the crucial fourth dimension in her thinking, to which she gives form through political analysis, ethical debate and legal intellectual rigor, citing architecture as a model.

EXPLANATIONS AND SOLUTIONS ALWAYS IN DEMAND

She has been in Germany since last June and in Göttingen since July, after which events unfolded in quick succession; she was increasingly called on to share her expertise, and was overrun with new requests for explanations and solutions, long-term strategies and instantaneous advice for the next day's decisions. The lawyer and political scientist says she longs to finally get back to the everyday life of the world of research, but she doesn't give the slightest impression of being exhausted. "I arrived at exactly the same time as the refugees," she says.

So: architecture. She really was heading in that direction, she explains. For a few years she dreamed of creating spaces, three-dimensional structures and volumes that would house and protect their residents, lend direction to their activities and a dimension to their thinking. "Imagine a cathedral," she says. "People were supposed to perceive how small they are in the face of divine greatness. That was the purpose of architecture then." In her vision of space, it should empower people instead.

In the aftermath of the Vietnam War, it was the boat people whose fate shook the world. Between one and a half and two million people who had escaped Vietnam also faced hostility in neighboring countries. So the refugees were forced onto the sea in rubber dinghies and fishing boats, floating coffins that were always hopelessly overfilled. They would arrive somewhere eventually. The international community ac-



tually responded at the time. Ships were dispatched and many of the homeless Vietnamese were saved and granted asylum in the US, Canada, Japan, and many in Germany, as well. But over 250,000 of them drowned. Ayelet Shachar was an alert and concerned young woman in Israel. The fate of the boat people must have affected her. At some point during this period she decided to study, not architecture, but law. After all, the two disciplines are not so very different.

The images we see today are similar. They portray dramas unfolding off the coast of Greece, at border fences in Hungary and in front of armed police at the gateway to Macedonia. But can

Room for law: As a lawyer and political scientist, Ayelet Shachar is interested in the question of how governments can create a contemporary legal framework for the phenomenon of global migration. Her work in Göttingen is also supported by the Max Planck Foundation.



laws provide a home? Define a home? "They can create spaces," Ayelet Shachar replies. That's already a huge step. They can offer safety, regulate coexistence, protect culture and, by way of a happy ending, lay the foundations for an identity - assignments that any architect would be proud to work on.

Her topic is the study of citizenship and migration, borders and refugees: collapsing systems, merging cultures, biographies without hope, and the fundamental right to a place to live and participation. And when all of that has been sorted out, when dry land has been reached, at least, and a temporary status established, the researcher is interested in how minorities integrate and how they are integrated. How does the tradition and culture of one group rank vis-à-vis the law of the other? How much identity does someone need to survive, and how unavoidable is a new start when all the coordinates have changed? She is interested in the question as to why a woman from Syria thinks it is acceptable to leave her apartment in Hamburg only with her

Right to a homeland: Where a child was born or where its parents come from currently determines its nationality and thus the opportunities it will have in life. In Ayelet Shachar's opinion, this principle is outdated. Instead, she advocates nationality based on a person's reality.





Laws can offer safety, regulate coexistence, protect culture and, ultimately, lay the foundations for an identity.

husband's permission and in his company. Where should a new way of thinking take over: With her? With the husband? With everyone else? Shachar has no propensity for pathos. She loves light and clear, functional lines - in architecture, too.

The questions come day in and day out. Should women from Afghanistan insist on wearing their veils when they face a judge in Europe? Is it acceptable for states to sell their citizenship, including the right to vote, like a commodity? What should be done when false passports come to light or when Tunisians and Moroccans mix in with the streams of refugees from Syria and Iraq? How much co-education should girls from Muslim families be expected to accept when it comes to physical education? How much special status is needed to make one group understandable to the other?

MILLIONS OF PEOPLE NOT **RECOGNIZED**

And does the definition of belonging to a community on the basis of a birthplace or the legal status of parents alone reflect the reality of life in a globalized world? The principles of jus soli and jus sanguinis are so old that they have Latin names: right of the soil and right of the blood. Shachar argues that it is high time that we adopted a jus nexi, a right of connection, based on which a person's reality dictates his or her citizenship.

She tells the story of a young man who arrived in the US with his parents when he was just ten days old. Jus soli applies there: anyone born on American soil is automatically an American

with all of the rights of a US citizen. His parents remained in the country. Their temporary visas lapsed. The entire family was illegal. The boy went to school like everyone else, as American law does not ask about citizenship when it comes to reading, writing and arithmetic. It was only when he applied to go to college that he discovered that, officially, he didn't even exist. He had never lived anywhere except the US. He was bright and curious and ready to take his place in the community - but he was a loser in the lottery for rights defined at birth and based on origin alone. Shachar's work on religious diversity and gender equality, "Multicultural Jurisdictions," had already generated a groundswell of interest. "The Birthright Lottery" is the book with which Shachar cemented her reputation as a combative thinker. "And that," she concludes her example, "is why we need a jus nexi to supplement and complement the other two principles." Millions of people are living without recognition.

"Here I am. I come from Canada, the global center of multiethnic, interreligious and multicultural diversity!" This is how she introduced herself to her colleagues from the Max Planck Society. Nor did she forget to mention the special situation in the city of her birth, Jerusalem, where the holy sites of three monotheistic global religions are located against the backdrop of an eternally smoldering conflict, a city dominated by the acute threat posed by almost all of its neighbors, a vital need for coalition and compromise, and a population with highly diverse roots and cultures: what else could she do but reflect on rules and borders and the opportunities offered by coexistence in such a multilayered, complex and conflict-ridden setting?

Sometimes she is impelled to provide an answer; sometimes, when politicians put pressure on her, she gives in and does just that. No, she says, if the scales of justice oblige such a result, of course you must convince the woman to remove her burka in court. After all, democratic discourse is not just about making your arguments heard; it is also about engaging with others while you do it.

MALTESE CITIZENSHIP FOR 650,000 EUROS

She is well able to tell stories and does so like a seasoned reporter. She backs up her findings with stories and anecdotes because people give their reality a structure through narratives comprising images and examples. She ignores the cautionary advice she has received from some colleagues that, in professional circles, it's better to attract attention by publishing a large number of individual articles, and joyfully owns up to the iconoclasm of her books. She's special, and she likes it that way. And such delight in argument and constructive confrontation could well provide fertile ground for the vision of a society that has accepted diversity and mobility as characteristics of its time, and develops opportunities from them. A society in which ideas count more than norms and fostering exchange is more important than sticking to the rules.

She tells about Canada and the US. where immigration and integration were constitutive elements of society from the outset - and where, neverthe-



Nobody gets into a rubber dinghy to paddle to America. Geographical location, history, economic power: everything has its weight.

less, all negotiations about access and acceptance take place, as far as possible, outside the territorial limits and, ideally, in the place from which the people embark on their journey. Naturally, it is alarming, to say the least, when a country like Malta puts its citizenship up for sale for 650,000 euros. This throws open a back door to the European Union and the Schengen area with no agreement or control. The few cosmetic changes subsequently imposed – the price increase and residency requirement - did nothing to alter the reprehensible nature of this business, especially in the case of people who were up to no good.

A RELATIVITY THEORY OF **MIGRATION**

Canada is vast, but it has only 35 million inhabitants. And the US, unlike Germany, isn't surrounded by nine different neighbors with nine different ideas about the needs of their citizens. Great Britain is an island and Greece has too many of them to be able to protect them effectively. "True," says Shachar: "Geography matters." Nobody gets into a rubber dinghy with the intention of paddling to America. Geographical location, history, economic power: everything will have its weight in the negotiations. The social obligation of the community to its citizens, the expectations of those who take to the roads and seas, their despair and possible disappointment, the ultimate strength of every detail is tested and each one can become a weakness that puts the entire system at risk. "To my knowledge, this takes effect ... immediately, at once," stuttered Günter Schabowski when he

was asked in front of the cameras of the Western media when the citizens of the GDR would be able to travel to the West without a special visa. That was on November 9, 1989, and the party official made world history without knowing it or intending to do so. He seemed helpless. The rustling papers in his hand had no better information to give him - but a minor uncertainty in the legal detail sealed the fate of his country.

No solution can be applied to the next case without being verified, and no structure will hold up if it was designed to accommodate a few thousand unfortunate refugees and one and a half million of them suddenly appear on the doorstep. Ayelet Shachar acts in systems whose essence and only constant is change. There were times, she relates from the history of the US, when there were grave doubts as to whether it would ever be possible to integrate Italian or Irish immigrants there. The scientist pauses with relish before reaching her punch line: "Today, Americans of Italian and Irish origin have exactly the same reservations about the Cubans. And who knows, maybe one of them will become the next president, or the one after that"

She erects her buildings on agile foundations. And in her expert reports, she recommends making this a feature of their design. Haven't architects in Japan shown that skyscrapers can grow even in earthquake zones? The scientist is also aware of the role of change in her simulations of reality: time is the fourth dimension of her architectural creations. Something akin to a theory of relativity of migration develops and unfolds in this way. The formula is basically simple: each detail alters the

whole. Every deported asylum seeker hardens the structures underpinning those who sent him away. Every accepted refugee alters the economy, demography, culture and social network. No one can say when and how critical values are reached and exceeded; no one can be certain which investment will pay off. But change can't be hindered, and every development opens up new opportunities.

The questions about the burka and the trade in citizenship remain important. And yet, Shachar constantly sees a threat to her role when she is expected to express her views in shorthand. Headlines are short, committees have other items on their agenda to get through, and political negotiators seek solutions by cobbling together a few points from each side's list into an acceptable compromise.

OLYMPIC PRIVILEGES FOR A SELECT FEW

Shachar focuses on the whole picture, not the pixels: it's the interaction of the elements that fascinates her, not so much the elements themselves. The scandal that arose around the Archbishop of Canterbury a few years ago was a warning to her. Rowan Williams argued that, in a society in which people of Islamic faith have also found their home, the application of their legal system must also be up for discussion. Sharia law in England? The outcry resounded across the entire country. "He referred to one of my books," says Shachar. But of course the headlines omitted all the analysis, the intricately developed logic of the argument, and the detailed explanation of the systemic relationships.



Politicians act like politicians; Ayelet Shachar is a scientist. She completed her undergraduate studies in Tel Aviv and her doctorate at Yale University. She has held guest professorships at Stanford and Harvard and a prestigious chair in Toronto. She is married to Ran Hirschl, a renowned expert in comparative constitutional law, was appointed a member of the Royal Society in Canada, and was invited to become Director of a Max Planck Institute. "Just don't look for any straightforward logic in my career," she says and laughs. "There is none!"

Except, perhaps, the logic that she has always gone where she was needed. Not so much to the individual building sites, but to the places where the master plan, the strategy, the political concept is being developed. The highest court in Canada has telephoned her, as has the World Bank and, more recently, the European Parliament, as well as other instances that prefer to keep such consultations confidential. Is there a better place than Göttingen to reflect on the routes and possible destinations

Renowned expert: Ayelet Shachar is popular as a speaker, but even more so as a political consultant. She began working at the Max Planck Institute in Göttingen in summer 2015 – at the same time as thousands of refugees arrived in Germany via the Balkans.





No solution can be applied to the next case. Ayelet Shachar acts in systems whose only constant is change.

of the current refugee crisis? A provocatively empty pedestal with no memorial figure on top was recently placed in front of the town's railway station. In the inscription, seven professors from the university scornfully thank King Ernst August for chasing them out of the country in 1837 during the struggle for a liberal constitution. Brothers Jacob and Wilhelm Grimm were among them. The spotlight of their global renown as linguistic researchers, fairytale collectors and fathers of a German identity shines today on nearby Kassel and Berlin. What remains for the people of Göttingen is stubborn mockery the empty pedestal is also, of course, a reference to the pompous equestrian statue that stands in front of the railway station in the federal state capital of Hannover and bears an inscription proclaiming the people's loyalty as the servants of their sovereign ruler.

Ayelet Shachar has to smile when she hears this story. It is exactly the kind of thing that appeals to her: a terse statement, an image confirming precisely what she gives the hotheads to think about when they try yet again to get her to corroborate a preconceived view. Sometimes, self-interest can also prompt more detailed reflection about a place where people can find a home. The Brothers Grimm weren't the only ones to receive a friendly reception in Kassel: before them there were the Huguenots, the Protestants driven out of France, a capable, ambitious and grateful people. And a good 300 years of history have confirmed the wisdom of that decision.

Shachar has just written a book about such benefits accrued by communities through migration, about the

pros and cons of the perhaps shrewd, but maybe also shortsighted importing of skills and competencies. Its title, "Olympic Citizenship," expresses a certain irony, as it is obviously an injustice to keep hundreds of thousands of people out of certain countries with barbedwire fences while promising others Olympic privileges because they can design complex computer programs or play football with particular skill.

BUILD BRIDGES, NOT WALLS

However, the starter pistol in the race for talent, the competition for highly skilled migrants with a willingness to adapt, has already been fired. Skeptical geopoliticians, demographers and economists have long bemoaned the corresponding loss of workers in countries that urgently need doctors, teachers and engineers. But countries like the Philippines have long been deliberately producing such employees for the global market. And the money the seafarers, building workers and welltrained nurses send back to their families at home is a fixed item on the asset side of their economic balance sheets.

This happens. The migrants pay their price, and it is very high. And governments know the value of people as a resource. In 2000, when Schröder's government failed to attract IT specialists - particularly from India - with generous promises, the reason wasn't just the bad weather in Germany, but the fact that the green card offered wasn't as attractive as the one provided by the competition. The attempt simply came too late and the tide was already in full flow. Large numbers of these employees completed their studies at Harvard or Yale, were accepted at Stanford, Caltech or MIT, and have since found their place on Wall Street or in Silicon Valley.

The world will look different tomorrow - of this Ayelet Shachar is certain. Tomorrow, the boxes from overseas will be unpacked, her books will line the shelves, and her colleagues will have taken their places at the desks in their beautiful white office suite. Sixty million people fled their countries in 2014. Many more have probably since followed them. The problem is spreading - with luck and astute action, it is possible to develop opportunities from it.

And Europe is by no means the only region that must ready itself for the migratory movements of the 21st century. The German federal finance minister travels to China to discuss the roles of both countries in the global banking system and to develop common ground in the area of migration. Everyone has realized that banks and finances are closely intertwined throughout the world. The realization that the operation of nuclear power plants, waste disposal, air pollution, climate change and the weapons trade can't be regulated by national forums alone is also gaining ground as the working basis for international conferences. However, the phenomenon of migration is still waiting for the recognition, analysis and management of its global dimension. The world needs workable ideas; not walls, but bridges - and, if possible, bridges that can be used at different times and in different directions. Good architecture creates the foundations for this. Ayelet Shachar devotes her time to thinking about such future foundations for a world of mobility.