

Show me the money

A bitter dispute lays bare questionable practices in China's foreign-talent programs

By **Mara Hvistendahl**, in Guangzhou, China

In a hotel room on the sidelines of a conference in China in 2011, theoretical physicist Ulf Leonhardt says he got an offer that was too good to refuse. The Centre for Optical and Electromagnetic Research (COER) here at South China Normal University (SCNU) invited him to spend 3 months a year at the center. SCNU later agreed to pay him a monthly salary of 120,000 RMB (\$19,300); three times greater than at his tenured position at the University of St. Andrews in the United Kingdom.

A prominent figure in theoretical physics who had made headlines by outlining a theoretical framework for an invisibility cloak, Leonhardt had no shortage of career prospects. But the offer from Guangzhou came at a moment when he was hard up for flexible funding that would allow him to travel and bring in visitors. And Leonhardt had watched, impressed, as China's huge investment in science had begun to reap dividends. Since his first visit in 2008, he'd noted "a really steep increase both in the quantity and quality" of papers in his field, he says. A longer stay made sense.

To supplement Leonhardt's COER salary, photonics expert Sailing He and colleagues at COER helped him apply to two government programs for attracting foreign talent: the Recruitment Program of Foreign Experts, or "Thousand Talents" plan, which offers a one-time 500,000 RMB (\$81,642) resettlement subsidy for a minimum of 3 years of part-time work, and a program offshoot called the Guangdong Province Leading Talent grant, which brings an additional one-time subsidy of 1 million RMB plus up to 5 million RMB in research funds over 5 years. (The full-time Thousand Talents program, which Leonhardt did not participate in, includes research funding as well as a subsidy.)

Thousand Talents and similar programs had struggled to attract candidates of international caliber (*Science*, 31 July 2009, p. 534),

and Leonhardt, who was applying at the peak of his career, seemed a shoo-in. By September 2012, he had snagged acceptances from both programs and had signed a 5-year contract with SCNU. The university offered his partner, Jana Silberg, a part-time job, too.

But Leonhardt and Silberg would come

to suspect that a substantial portion of his grant money and the salary due to Silberg were being diverted to other uses. After hiring lawyers to investigate, they claim that they uncovered a web of misinformation, including incorrectly translated agreements and covert purchases of equipment at COER.



"The fraud they committed was so brazen," charges Leonhardt, who bailed out of his contract after spending just one summer in Guangzhou.

Sailing He denies that COER diverted any funds, and others at COER say that Leonhardt agreed up front to an arrangement in which the bulk of his grant would be administered by others. Sailing He calls Leonhardt ungrateful for COER's help in securing the lucrative arrangement: "He was getting \$20,000 USD a month. He doesn't need to care about the details."

At a time when China is spending heavily to recruit talented overseas scientists, the dispute between COER and Leonhardt is a cautionary tale. Interviews with other foreign-born recipients of Thousand Talents awards reveal that host institutions in several instances have seized the reins, controlling everything from the application process to grant administration. Among Thousand Talents awardees interviewed by *Science*, ignorance of the program's nuts and bolts—even at the most basic level, such as the amount of money they are due—is the norm.

Both sides in the dispute blame the other for failing to live up to expectations. Sailing He says it boils down to cultural differences: "In China, you have to be flexible," he says. Things are "not always [done] according to the regulations. But it's not with bad intentions."

BORN IN SCHLEMA, in former East Germany, Leonhardt, 49, studied at Humboldt University in Berlin and elsewhere before moving over to the University of St. Andrews. (He now works at the Weizmann Institute of Science in Rehovot, Israel.) His theoretical research focuses on novel optical effects such as so-called transformation optics—bending light in curious ways with metamaterials, or assemblages of rods and rings smaller than a wavelength of electromagnetic radiation. In 2006, he showed how metamaterials could be fashioned into a circular shell capable of funneling light around any object placed inside, rendering it invisible—as did, independently, John Pendry of Imperial College London and colleagues (*Science*, 23 June 2006, pp. 1777 and 1780).

Since then, Leonhardt has continued to study other novel optical phenomena, such as making an analog of a white hole—sort of the opposite of a black hole—in an optical fiber (*Science*, 7 March 2008, p. 1321). "Leonhardt is definitely one of the top scientists in our field," says Xiang Zhang, a physicist at the University of California, Berkeley.

Sailing He, meanwhile, had made a name for himself in photonics, the effort to develop technologies that manipulate light much as electronic devices control the flow of elec-

tricity. Like many talented Chinese researchers, he left the country in the 1980s to study overseas. In 1992, he earned a Ph.D. from the Royal Institute of Technology in Stockholm, and in 1996 he received tenure and Swedish citizenship. Since then, He has authored or co-authored more than 400 peer-reviewed publications.

In 1999, He returned to China as one of the first recruits under the prestigious Changjiang Scholars Program, which entitled him to a premium-level salary at Zhejiang University in Hangzhou and optional research funding. He took advantage of his pedigree to build crucial ties overseas, boasting of importing international standards to China: “With finances we use a transparent style of administration, dropping the bad habits of the past,” he wrote in an article published on Zhejiang University’s website in 2001.

In 2011, He took a part-time post at SCNU, devoting himself to the newly created COER. Early on, the center landed a respected Swedish couple as part-timers: physicist Sune Svanberg, an expert in spectrometry, and oncologist Katarina Svanberg, who studies laser light interactions in biological tissue. The center’s staff also includes physicist Liu Liu, a recipient of a Young Thousand Talents award, which is available to scientists under age 40. In recruiting Leonhardt, Sailing He told *Science* that he hoped to “raise the local level of research in metamaterials.”

In August 2011, He and colleagues at COER began assembling application materials for Leonhardt’s Thousand Talents and Leading Talent submissions. (*Science* reviewed documents and e-mails provided by COER and by Leonhardt.) Ma Yungui, who works with He at Zhejiang University, says he wrote most of the two applications, which were in Chinese. Leonhardt says the center never sent him either the Chinese version or an English translation of either document (COER says he never asked); he later obtained the Leading Talent application through his lawyers.

In July and September 2012, after Leonhardt won acceptance to both programs, he and Silberg signed contracts with SCNU. She was hired as an assistant in international affairs for COER during the 3 months of the year that the couple would spend in Guangzhou. Leonhardt’s contract specified that he was to “publish some high quality papers in top journals (like *Science*, *Nature*, or *Nature* series) with the first affiliation of COER.”

Leonhardt’s contract is bilingual, with English and Chinese versions of clauses side by side. But the versions differ in content: Silberg, who has a Ph.D. in business admin-

istration and is accustomed to scrutinizing such documents, spotted a numeral in the Chinese version that was missing from the English: 6. In fact, the Chinese document contained an extra clause stating that Leonhardt’s “total amount of time” working for the center would “reach 6 months”: 3 months in Guangzhou and 3 months overseas. The English version said the work abroad was “limited to” 3 months, on top of the 3 months in Guangzhou. It did not mention 6 months. Leonhardt and Silberg asked He to remove the extraneous clause from the Chinese contract, and after what they describe as a heated debate, COER offered Leonhardt an amended contract.

Copies of the second contract show that COER inserted a statement saying that the English text would take precedence over the Chinese version. But the center did not delete the disputed clause, instead merely replacing the Roman numeral 6 with the Chinese character. The clause was likely inserted to maintain the Leading Talent grant, which does not offer a short-term



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Ulf Leonhardt, Weizmann Institute of Science

option; the minimum time commitment required by the grant is 6 months.

Leonhardt would later learn that the contract had other inconsistencies. It mentioned the 1 million RMB (\$164,000) resettlement subsidy from the Leading Talent award but omitted the additional subsidy due to him from the Thousand Talents program. Liu, the young researcher at COER, wrote in an e-mail to *Science* that the center didn’t address the subsidy in the contract because “we did not know” that the short-term Thousand Talents program included a subsidy. COER told *Science* in an e-mail that Leonhardt “should be able to find out all the details pertinent to this title by himself.” In a subsequent e-mail to *Science*, COER said it was Leonhardt’s idea to apply for the Thousand Talents grant and that COER professors merely helped him as a favor.

THE THOUSAND TALENTS plan, or *Qianren Jihua*—aimed at recruiting up to 2000 leading scientists, entrepreneurs, and financial experts over 5 to 10 years—was launched in 2008 by the Communist Party of China’s powerful Organization Department. With the party backing the program, provincial

governments dove in, setting targets for the number of recipients they would attract and starting competitive local programs like the Leading Talent award. “If a guy becomes a Thousand Talent, there are cases where that guy is getting multiple local benefits—local incentives, local grants,” says Wang Huiyao, director of the Center for China & Globalization (CCG) in Beijing.

As an incentive for recruiting scholars, some universities are also given rewards, says David Zweig, a political scientist at the Hong Kong University of Science and Technology who studies the international flow of talent. At one university in northern China, attracting a recipient for either the full-time or part-time Thousand Talents program earns the institution 12 million RMB (\$1.96 million), according to a paper Zweig and Wang published in *The China Quarterly* in September 2013. A portion of that payment is supposed to go to salary for the recruited scholar, with the rest distributed to other faculty. Some local talent programs, meanwhile, offer an 8 million RMB (\$1.31 million) payment to universities that recruit full-time candidates, Zweig and Wang found.

Despite such incentives, the program has struggled. Scholars who hold tenured positions in Europe or North America are unlikely to drop everything to take on full-time 5-year contracts in

China, notes Cong Cao, an expert on Chinese science policy at the University of Nottingham in the United Kingdom: “That’s something wrong with the program design from the beginning.” As a result, some institutions resort to recruiting scholars already in China. Others hire scientists with full-time commitments overseas, and then assure them that no one will strictly review their time sheets, Cao says. Some scholars “drop in for 2 weeks of the year, and that’s it,” says Neil Foster, a chemical engineer at the University of New South Wales in Sydney, Australia, who in 2010 received a Thousand Talents award to work part-time at the Beijing University of Chemical Technology.

The scope for abuses grew as the Thousand Talents program, which originally landed mainly high-profile overseas Chinese, cast a wider net. In 2011, the Organization Department launched the Recruitment Program of Foreign Experts and published program requirements—but not application materials—in English. Many candidates now don’t speak or read Chinese. According to Cao, that could allow institutions to cheat the government “without the knowledge of the person they are going to hire.”

COER AND SILBERG originally agreed that her salary would be paid monthly, even when she wasn't in Guangzhou. But in November 2012, 2 months after her contract began, she still had not received any money. Earlier, Wendy Huang, COER's administrative assistant, had written Leonhardt that the university's personnel department had decided not to pay Silberg until she was in Guangzhou and that Huang was "too busy" with an upcoming conference to help with the situation right away. Now Leonhardt raised the issue again.

Sailing He chimed in by e-mail to say he had a "quick solution" and suggested that he and Leonhardt hash out the details on Skype. In that call, Leonhardt says the Chinese scientist explained that he had a sum of money that might be used to pay Silberg. (Sailing He denies this.) Soon after, He e-mailed Huang instructions to have 500,000 RMB (\$81,637) transferred to Leonhardt's bank account. Sailing He called the sum a "tax-free subsidy" but did not explain in the e-mail that it was the resettlement money owed Leonhardt under the Thousand Talents award.

Silberg and Leonhardt were confused. Her contract prescribed a salary of 80,000 RMB (\$13,061) a year; even if COER were to pay her for all 5 years at once, she would be due only 400,000 RMB (\$65,303), and that would have been taxable. "We did not want to take it," Leonhardt recalls. "It smelled very unkosher." But he hadn't yet received his resettlement subsidy from the Leading Talent award, and he says they needed the money. In December 2012, he e-mailed Sailing He that he would accept the money only as "an advance on the housing payment" from the Leading Talent grant. Sailing He e-mailed that Silberg "will get whatever is in the contract, missing nothing. One needs to be a bit flexible in China in order to fix things effectively (instead of spending too much time/effort on it)." Leonhardt received his Leading Talent subsidy in December, and about 2 months later, he returned the money as promised, transferring it to Huang's account on her instructions.

In June 2013, Silberg and Leonhardt arrived in Guangzhou for 9 weeks of work, a period that also included lectures and conferences elsewhere in Asia. Leonhardt describes the research environment at the institute that houses COER as uninspiring. Apart from one team working on optical fibers for linking supercomputers and the work done by the Svanbergs, the institute appeared moribund, he says: "I'd see students in seminars, and they were falling asleep." But his hosts had reason to be pleased. The month he arrived,

Leonhardt published an article in *Nature's* "News & Views" section, commenting on the cloaking of heat and listing COER as his primary affiliation, as his contract required. SCNU plugged the piece on its website, calling it the "first paper published in *Nature*" to prominently name the university, and later including it as one of the university's top 10 "big research achievements" of 2013.

DURING HIS TIME IN GUANGZHOU, Leonhardt planned to work on the theory of Casimir forces, a strange pull or push between two closely spaced objects that arises because of quantum mechanical fluctuations in the vacuum of empty space. He thought much of the 5 million RMB research funding he was due from the Leading Talent program would go to paying his salary and overhead. That would leave up to 1.5 million RMB (\$244,917) in funding for traveling and hosting visitors in connection with this theoretical research.

In fact, Leonhardt was paid out of COER's budget, as is standard with China's foreign-talent programs. That left up to 3.5 million RMB (\$571,508) in research funds for other uses. The Chinese version of a document he had signed the year before had given Jun

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Sailing He, South China Normal University

Li, the center's deputy director for administration, wide-ranging authority to spend Leonhardt's funding on equipment whenever he was away from Guangzhou. Yet the English translation COER gave Leonhardt stated only that Li would be able to "sign some papers about financial affairs for my funding when I am out for business." (COER says the Chinese and English versions are legally equivalent.)

In December 2012, COER ordered a linear motor stage and controller, monochromators, lasers, and four laptop computers—for a total of \$116,741—using Leonhardt's Leading Talent research money. Leonhardt says that he didn't need any of the equipment for his planned theoretical work.

A document that Li gave *Science* includes a slide that shows Leonhardt heading up a team of four researchers and explains that one of the laptops, along with several other computers, workstations, and a printer that the center later purchased, were for these scientists, who would together work on "Casimir force, etc." The label on the slide itself refers to a different line of research, metamaterials, and Liu, one of the scientists

pictured in the presentation, laughed when asked about the project: "I don't know anything about Casimir forces."

The introduction to Leonhardt's Leading Talent application in Chinese describes, along with cloaking, a very different line of research: military stealth technology. "At microwaves and other low-frequency waves, absorbent materials can lower the scattering of electromagnetic waves for aircraft and other military targets, so as to achieve anti-radar stealth," it reads. The application goes on to suggest that such research is based on transformation optics. In fact, absorption is effectively the enemy of many applications of transformation optics—cloaking in particular. Cloaking aims to funnel light around an object. Absorption, which Leonhardt does not study, subverts that process by making the cloak cast a shadow.

Leonhardt charges that COER was "smuggling in an alien research project in the grant proposal they wrote in my name." A budget estimate prepared for the Leading Talent project suggests that fully 2.7 million RMB (\$440,826) of his 5 million RMB in research funds would be spent on equipment for applied research topics outlined in the Leading Talent proposal: "super-resolution display and metamaterials," including spectroscopic tools. Leonhardt says he saw neither the application nor the budget estimate until his lawyers procured them and that he assumed the entire grant would focus on theoretical research. (Since this story first appeared, however,

Science has learned that Leonhardt received a first draft of a PowerPoint presentation about the grant proposal, prepared on his behalf. Leonhardt also helped present the slides to a committee in Beijing.)

COER has a different take. An e-mail from Huang on behalf of COER says that, "Even though Ulf is the PI [principal investigator] for the leading talent project, this project is a team work requiring both his theoretical part and the experimental efforts from some COER full-time faculty members."

Leonhardt suspects that the Leading Talent documents emphasize absorption and spectroscopy because that is what Sailing He studies. This past July, for example, He and colleagues described in *Applied Physics Letters* a metamaterial coating that works as a perfect absorber of microwaves of a particular frequency. "They seem to have sold me to the Chinese military, like a Greek slave to the Roman legions in a different era," Leonhardt contends.

SCNU professor Ao Xianyu, writing on behalf of COER, says that work on absorption and cloaking aren't really so disparate, arguing that the mathematical tools of trans-

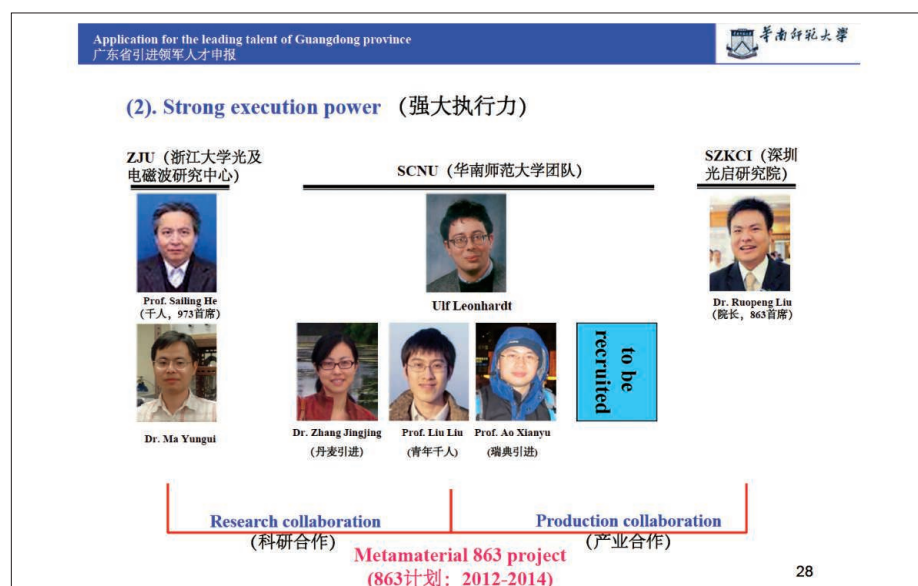
formation optics are applicable to designing better absorbers. Ao also says that the work on absorbers was included in the Leading Talent proposal to satisfy a requirement to produce something that could be commercialized. “Otherwise, there is no chance to get this project approved at all,” Ao says. “Leonhardt knew this reason quite well and agreed to this from the draft preparation to the final presentation.”

Leonhardt insists he never saw a draft. When he began to have concerns, he e-mailed administrators for both programs, along with officials at the Ministry of Science and Technology; the Chinese Academy of Sciences; the Central Commission for Discipline Inspection, the Communist Party’s anticorruption watchdog; and the National Natural Science Foundation of China. None responded directly to him, he says.

Representatives of the Leading Talent program reached by phone by *Science* declined to discuss the details of Leonhardt’s grant, which was canceled on 9 October. The State Administration of Foreign Experts Affairs (SAFEA), which administers the Thousand Talents program for the Organization Department, did not respond to repeated interview requests.

Interviews with other foreign Thousand Talents recipients suggest that ignorance of award conditions is common. For example, Geoff Gadd, a geomicrobiologist at the University of Dundee in the United Kingdom, who has a part-time award for work at the Xinjiang Institute of Ecology and Geography in Urumqi, wrote *Science* that he has not received a resettlement subsidy or any information about the program in English. “I am not sure who administers the grant,” Gadd wrote. “I received no details about this kind of thing.” Fuel cell expert Subhash Singhal, a fellow emeritus at the Pacific Northwest National Laboratory in Richland, Washington, says he had a similar experience at the China University of Mining and Technology in Beijing, where he received a short-term Thousand Talents award: “[With] the grant process, I had absolutely no idea what they were doing or how they were doing it.” His host institution’s lack of transparency about award money issued in his name would probably deter him from returning to China, he says.

Several grant recipients say that the program has proven fruitful, and they were keen to renew the terms of their stay in China. “The networking is going to be long-term huge for me,” says Michael Arnold, who received a Thousand Talents grant to work at the Kunming Institute of Zoology. “I can just see ripples going out through the rest of my career.” But even those who were happy with their experience were not clued in to



A PowerPoint presentation prepared to accompany Leonhardt’s Leading Talent grant application depicts a research team that he says didn’t exist.

grant administration. Four out of the five researchers interviewed by *Science* say that they did not receive a resettlement subsidy. Foster says he received no money at all; his university in China paid for his accommodation, but he did not earn a salary and says he “didn’t claim” a subsidy.

CCG’s Wang concedes that the program has had growing pains. “There could be problems, there could be fake [scholars], there could be scandals.” But he maintains, “The general picture and the message they’re sending to attract talent is good.”

WHEN ASKED ABOUT Leonhardt’s allegations, other foreign scientists who work with Sailing He profess disbelief. Sune Svanberg says he and his wife felt “very appreciated” at COER: “We never felt that anything was different from what was said. I’m just astonished that something like this would develop.”

Sailing He and others insist the dispute boils down to a personality conflict. They note that Leonhardt sued the University of St. Andrews in 2013 over pay for vacation days he never took. Leonhardt responds that his claim was justified, and he received compensation for most of the days. (The University of St. Andrews declined to comment, citing privacy laws.)

Leonhardt and Silberg never returned to China for the second year of their 5-year terms. For months, they tried through lawyers to figure out what exactly had happened with the grant money due to Leonhardt, while attempting to terminate their contracts. Last December, COER still hoped to woo Leonhardt back; in an e-mail, Sailing He offered him a sum equal to the

amount spent on the disputed equipment for “whatever equipment you tell SCNU to buy.” Leonhardt refused. SCNU terminated their contracts in June.

COER now argues that Leonhardt was not in Guangzhou for the amount of time agreed upon in his contract, that he tried to abuse his travel funds while at SCNU, and that “he did not show any interest or intent in either building a lab or a research group,” Li wrote in an e-mail. “Introducing [Leonhardt] to South China Normal University was the biggest mistake of my academic career,” says Sailing He, who recently proposed to SAFEA that the Thousand Talents program dole out the resettlement subsidy over the course of a grant, rather than provide a lump sum up front.

Early last month, COER sent *Science* Leonhardt’s Thousand Talents application, which Leonhardt had tried in vain to obtain through his lawyers. The date on the application—18 August 2011—predates his initial trip to Guangzhou to discuss the award. The document, in Chinese, describes research on Casimir forces, which Leonhardt says he didn’t suggest until a year after the application was purportedly submitted.

Leonhardt suspects the document is a fake. COER acknowledges it doctored the date because it submitted the application after the deadline passed, but the center says the file is genuine except for the submission date. It maintains that its researchers prepared the document at Leonhardt’s request as a “personal favor.” In an e-mail to *Science*, Li explained it this way: “We were just passively helping him.” ■

With reporting by Adrian Cho.