

**never sleeps**



**1:44 A.M.** The dance floor heats up at Propaganda, one of hundreds of clubs throbbing until dawn in liberated





**4:52 P.M.** Darkness falls as a building rises along the Moscow River. Laborers, most from former Soviet republics,







**7:30 P.M.** Friends Yevgeny, Anatoly, and Viktor polish off an evening with fistfuls of beer and smoked fish at



the 200-year-old Sanduny baths, traditional gathering place for Moscow's workaday crowd. **PHOTOGRAPHY** 113



10:59 P.M. In the opulent Turandot restaurant, Mozart is merely background to conspicuous consumption that





By Martin Cruz Smith

Photographs by Gerd Ludwig

**Moscow at night is a fairy tale with menace. A Cinderella who doesn't leave the Kremlin by midnight could lose more than a glass slipper.**

At midnight the city is a brilliant grid of light that includes the gilded dome of the Cathedral of Christ the Savior, the Stalinist horror of the Ukraine Hotel, and a dark loop of the Moscow River. Downstream the lights of round-the-clock construction hang in the air while steel and concrete disappear. The clutter of the day is gone. The night brings clarity, and lights trace the future.

On Sparrow Hills, however, all eyes were on an unsanctioned rally of motorcycles: Japanese bikes as bright as toys, dour Russian Vostoks, "monster" Ducatis, Harleys with exhaust pipes of polished chrome. Hundreds of bikers and admirers filled the vista terrace to see machines that posed on their stands in the negligent fashion of movie stars. A Harley merely had to clear its throat to thrill the crowd.

Some bikes were so customized it was difficult to determine what they started as. A Ural that usually hauled sacks of potatoes in its sidecar had been transformed into a stealth-black predator bristling with rockets and machine guns. As the machine-gun barrels were chair legs and the handlebars were crutches, the effect was more theatrical than threatening. Despite the display of leather and studs, the same could be said of the bikers. I asked an ogre with a shaved head and bandanna what his day job was.

In a growl, "I sleep."

To which his girlfriend added, "Fievel's a computer programmer."

Geek by day, bandit by night.

My friend Sasha was along. Sasha is so soft-spoken he seems shy, when in fact he is a homicide detective who weighs his words. In the army he competed in biathlons, the sport of racing on skis with a rifle and then stopping to shoot at a target as his heart pounded against his ribs. He still has that calm.

We first met years ago in an Irish bar in Moscow. My highly intelligent colleague Lyuba and I were celebrating the end of two weeks of on-the-ground research and interviews for one of my novels. Sasha had just dragged some dead mafia from a swamp and was in no mood for fictional heroes. Now that he is married to Lyuba, he is forced to endure my constant questions, although he gripes that my Investigator Renko should be a regular detective like him.

Racing began across the boulevard. Competitors were a blur between spectators, the smaller bikes accelerating with a whine while the heavyweights produced a roar that made the ground tremble. The finish line was negotiable, anywhere from a hundred meters to a circuit of the Garden Ring, the peripheral road around the center of Moscow, where bikes could reach 120 miles an hour, depending on traffic. Car races also took place, or did until the crackdown after YouTube featured videos of drivers weaving in and

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*Martin Cruz Smith's latest novel about Moscow Investigator Arkady Renko is Stalin's Ghost. Gerd Ludwig has been photographing Russia since 1980.*



**12:03 A.M.** Bikers roost at midnight on Tver Square. They flaunt rebellious leather, show off Harley and Honda choppers, and brag of outracing cops. Ilya (at left), a real estate dealer by day, explains the appeal of a big bike in Russia: "It's power you control in your hands."

out of Ring traffic at three times the speed limit.

A biker in a padded leather outfit—more a belief system than actual protection—mounted a Kawasaki, maybe 750cc. What did I know? I once rode a Vespa scooter from Rome to the south of Spain; that's the extent of my expertise, and I worried when a teenage girl wearing little more than a helmet hopped on behind. As soon as she had a grip, they glided toward the race lanes. The girl looked so frail I had to ask, Who is in charge? Where are the police?

Sasha pointed at a group of militia officers who stood bashfully to one side.

"It's out of their control."

The bikes blasted off the mark. In seconds the kids were taillights that faded away.

**WHO IS IN CHARGE?** Vladimir Putin? His successor, Dmitry Medvedev? The legendary oligarchs? The KGB disguised as a kinder FSB? (There does seem to be an active or former secret agent on the board of every major company.) Well,



## A special **suicide feature** of several Russian avenues

as they say in Russia, "Those who know, know." What is certain is that Moscow is afloat in petrodollars; there are more billionaires in Moscow than in any other city in the world. More than New York, London, or Dubai. Millionaires are as common as pigeons. Together the rich and mega-rich constitute a social class who were loosely called New Russians when they first appeared in the 1990s. Half of them are survivors of industrial shake-ups like the "aluminum war" of ten years ago, when executives were killed left and right. Half have discovered that starting a bank is more profitable than robbing one. Half are young financial trapeze artists swinging from one hedge fund to another. (You can have three halves in Russia.)

But what a change. When I first visited Moscow in 1973, the entire population of the city seemed to retire to a crypt as soon as the sun went down. The few cars on the street were small, dyspeptic Zhigulis. A shop window display might be a single dried fish. Red Square was empty except for the honor guard at Lenin's Tomb, and billboards featured the stony visage of General Secretary Brezhnev. Banners declared, "The Communist Party Is the Vanguard of the Working Class!" That was the world that today's New Russians grew up in, and it is no wonder that their repressed energy and frustration have erupted with a passion.

Russians are over the top. They're not "old money" hiding behind ivy-covered walls. In fact, they often refuse old money. It's new money, crisp American \$100 bills flown in daily and spent almost as fast. Think about it. A billion dollars is a thousand million dollars. How do you celebrate success on such a scale? How much caviar can you eat? How much bubbly can you drink? Et cetera. That's why clubs were invented.

Clubs give the rich the chance to "flaunt it, baby, flaunt it," assured that "face control" will stop undesirables at the door. Face control is executed by men who in a glance can

determine your financial profile and celebrity status. And whether you are carrying a gun.

The first sign that the GQ Bar was hot was the number of Bentleys and Lamborghinis lined up at the curb. I was visiting with writer Lana Kapriznaya and journalist Yegor Tolstyakov. Lana is dark haired, petite, about a hundred pounds, including cigarette smoke. She is an acerbic chronicler of the follies of New Russians. Yegor has a voice meant for a dirge, but see him, and he's smiling.

"Think of the GQ as a boy's club," Lana said. "A boy's club with bodyguards."

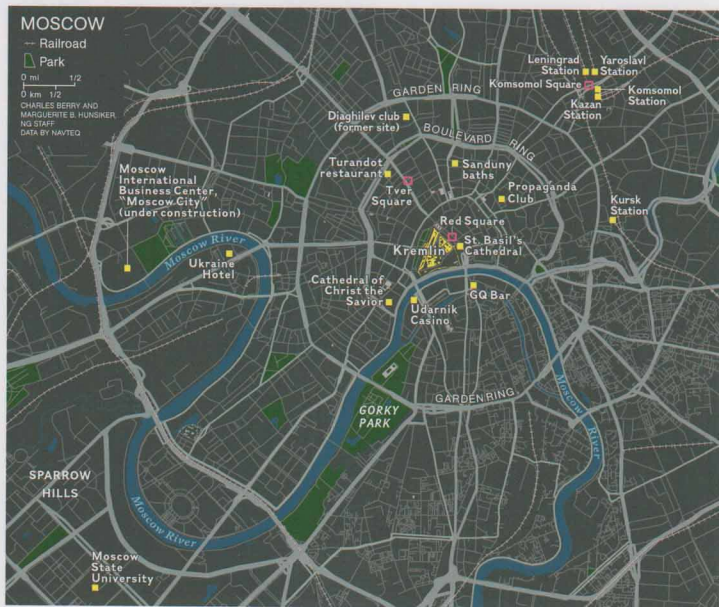
New arrivals were greeted by women who were beautiful on a surreal level. Big air kiss. Big air kiss. The GQ Bar is licensed by the magazine publisher Condé Nast International, which provides a steady supply of models who sip water at \$20 a bottle and pick at Kamchatka crab, a giant crustacean served with six sauces. The interior design is out of Somerset Maugham, all dark woods and lazy ceiling fans. Not hungry? Nyet problem. GQ's VIP lounge is a watering hole for lions only. Here a man can sip Johnnie Walker Blue, light a Cuban cigar, sip a brandy, unwind, and make more money.

New Russians are social animals; they squeeze business and pleasure together the way Russian drivers squeeze five lanes out of four. The office is full of petty distractions: meetings, phone calls, endless details. Billion-dollar deals await the cool hours of the evening. There is a Russian tradition that you can't trust or do business with a man until you have been drunk together. Food, vodka, money, they go hand in hand.

More astonishing than the grooming of men is the transformation of women. In the few years since the collapse of the Soviet Union, Russian women have metamorphosed from hefty builders of socialism to tennis stars who stand a head taller than the general population. During the day, clones of Maria Sharapova move from spa



and highways is a middle lane that runs in both directions.



**BOOM CITY** Gravitational center of Russian power and wealth, Moscow's sprawling domain houses ten million people and growing as the 900-year-old city reinvents itself from stagnant Communist capital to dynamic, profit-mad metropolis. Enriched by exports of crude oil and natural gas, the city core booms with construction, its biggest overhaul since the 1930s, when Stalin ordered the building of subway lines and parade-wide avenues. Preservationists rue the tearing down of hundreds of historic buildings. And commuters face gridlock as surging car ownership overwhelms the ring roads.

## There are more billionaires in Moscow than in an

to spa. At night, they go from club to club in the giddy hope of meeting their own millionaire.

While a GQ deputy director named Sergei gave us a tour, Lana described the buy list of a New Russian: "a flat in Moscow, a town house in Belgravia, a villa in St.-Tropez, a ski chalet in Courchevel, foreign schools for his children, foreign banks for his money, and, finally, a private jet to fly away in."

This is a sore point in Russia. Even in the worst days under Stalin there was a general sense of classlessness. People didn't have money, they had perks: a larger ration of sausage, an extra week at a sanatorium, access to foreign films. The New Russians have emerged in a cloudburst of dollars, and they are, in the eyes of most people, thieves. Their lifestyle is both envied and abhorred, and since Moscow is the center, there are imitations of its club scene across the country. It is fair to say that for many young Russians, clubs define the night.

Sergei described the clubbing schedule: 10 to 12 is for pre-party socializing in the restaurant, 12 to 4 for partying in the clubs, 4 to 6 for post-party cooling off. He informed me that when Mickey Rourke is in Moscow, he parties at GQ. I can imagine Rourke partying until dawn. I imagine myself in bed, my head on a pillow.

We left GQ and hit a club that was launching either a new BMW or a new vodka or both. Then to a club in Gorky Park for a more democratic crowd where, besides playing Whac-A-Mole with a rubber mallet, you can walk on a man-made beach. Nice place.

Nonetheless, I felt that I was missing something. What was the very best club in Moscow? Which was the most fantastic?

"Well," Lana said, "there's Diaghilev."

"What makes it so popular?"

"No one can get in."

**THREE STATIONS—PART ONE** If Diaghilev is Moscow's Mount Olympus, Three Stations is its lower

depths. Officially Three Stations is Komsomol Square, but the locals know it by the railway terminals that converge there: Yaroslavl and Leningrad Stations on the north side and Kazan Station on the south. A statue of Lenin stands on a side plaza. The firebrand of the Russian Revolution holds the lapel of his coat with his left hand and with his right reaches for a back pocket. He appears to have just realized his wallet is gone. That's Three Stations.

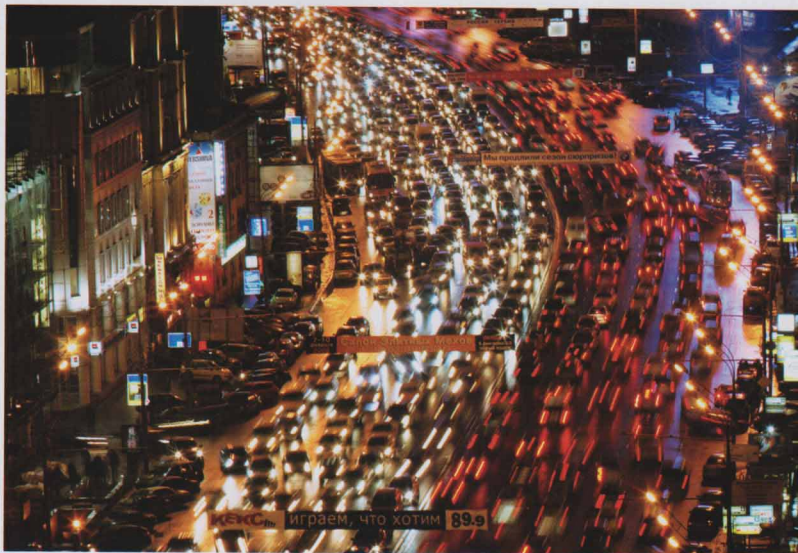
Every day thousands of commuters arrive and pour out onto the wide pavement against a counterflow of traders dragging in suitcases stuffed with clothes and shoes for resale in the provinces. Street vendors offer rabbit fur hats, Soviet kitsch, roses wrapped in cellophane, pirated CDs. Tourists stagger under backpacks. Women from Central Asia brush by in voluminous skirts the color of poppies, while soldiers search for game arcades.

Every kind of face surfaces. Blue-eyed Ukrainians, hawklike men from the Caucasus, Uzbeks in caps, Mongolians, and especially Tajiks. A demographic time bomb facing Russia is its declining population and the influx of Tajiks, who are known to be sober, hardworking, and willing to do jobs Russians won't.

But at 2 a.m. the square was vast and still. The misty light of streetlamps revealed what the traffic of the daytime, the coming and going of travelers and peddlers, had hidden. The drunks around Kazan Station were difficult to see at first because they were as gray as the pavement. These were not casual drunks or men on a bender but dedicated alcoholics literally pickled in vodka. So many were bandaged or bloody they could have been a battlefield tableau. One held up a cardboard sign that said "Give Us Money or We'll Die."

Behind the station lay a dark alley of shuttered kiosks and homeless people wrapped in rags and newspaper. Those capable of standing staggered

other city. Millionaires are as common as pigeons.



**7:08 P.M.** Traffic grinds and snarls at rush hour on the eight-lane Garden Ring, frustrating the growing number of Muscovites who have splurged on swift Western cars. Gone are the days, as recent as the early 1980s, when stolid homegrown Zhigulis and Moskviches ruled near-empty city roads.

sideways. In the faint light a woman dressed in rags tied a bouquet of lavender. The one kiosk that was open sold vodka, of course. Shadows dashed by. Street kids.

"These are free people," Sasha said.

"You mean homeless?"

"No, there are shelters. They choose this. Free people."

We watched prostitutes in tight pants grind by. They have a reputation for breaking clonidine pills into soluble powder. Clonidine is a

powerful blood pressure medication. One spiked vodka and the customer passes out, ready to be stripped. When the victim wakes in his underclothes, he probably won't run to the nearest militia officer. Drunk or not, he should know that at Three Stations the police are the pimps.

As we moved farther into the shadows behind the station, we came upon a scuffle between two gangs, Russian versus Tajik, about eight on each side, ages from 10 to 20. No knives were in sight, although a Tajik had a (Continued on page 130)





9:39 A.M. Days begin in the dark for many commuters streaming through Moscow's subway. A Soviet-era





monument to the noble proletariat, palatial Komsomol Station now bustles with harried capitalists. 123



**10:45 P.M.** Angel of the night, volunteer Tatyana Sveshnikova attends to a battered homeless man near Kursk



Station. In recent winters, hundreds of homeless have frozen to death on city streets.



11:34 P.M. Artist German Vinogradov wields a blowtorch to season the look of his latest landscape. Active in





the cultural underground during Soviet times, Vinogradov says, "Nothing is taboo now."



**8:04 P.M.** Strangers in a "flash mob" cued via the Internet show up to kiss amid the crowds near Red Square



From here they'll scatter into the night, reveling in the anything-can-happen world of Moscow after dark. 129

## For their own protection everybody had a "roof." Don't think of it as

(Continued from page 121) Russian down and was pounding his face into the concrete.

Sasha told me to stay where I was and waded alone into the melee. The Tajik paused, his fist cocked, trying to figure who this interloper was. The Russian on the ground lifted his battered head, trying to work out the same thing. I heard Sasha give them the Russian equivalent of "Break it up and go home." But the gangs were home, both sides claiming the same turf; that was the problem. About the only thing they hated more than each other was an outsider.

They weren't innocents. They dealt drugs, rolled drunks, and swarmed over anyone they caught alone and unarmed. The Tajik picked up his hat, a jaunty fedora, and immediately I thought of the Cat in the Hat. The Russian got to his feet. He looked like an ingrate to me. Suddenly we were in Dirty Harry territory. Did Sasha have a gun? Did the gang feel lucky? Well, did they?

Not tonight. Instead, they beat a sullen retreat. I may have been an easy target, but Sasha was definitely not to be messed with. The Cat in the Hat saluted him and called him "brother," as if they'd meet again.

As a matter of fact, tucked into his belt, Sasha had a pistol that he's proud of because it was given to him as an award for meritorious service. One side of the gun frame is inscribed like a trophy with his name. He hates to use it.

**CARS** During the day the streets of Moscow are dominated by black Mercedes sedans with tinted windows so opaque they are against the law, which no one pays attention to. When Mercedes cluster at a ministry gate, I am reminded of a Roach Motel.

At night the BMWs and Porsches come out to play. Night traffic around the Kremlin has a centrifugal force that catapults them to speeds no police car can match, and even if a driver is caught, he simply bribes the police on the

spot. It's not unlike American fishing: catch and release. Russia has an alarming accident record. Considering that a driver's license can be had for a bribe instead of a demonstrated ability to operate a vehicle, the numbers aren't so bad.

A special suicide feature of several Russian avenues and highways is a middle lane that runs in both directions. This lane is reserved for cars with blue roof lights so that high officials can hurry to affairs of state. Such a light is a desirable item for New Russians in a rush; the going price for a blue light and official license plates is \$50,000. It is not unusual to see two motorcades speeding toward each other in a Russian version of chicken.

**SOBRIETY** It was late in the afternoon, the sun dissolving into afterglow by the time I arrived for lunch at Alexei's apartment (not his real name). Alexei and Andrew were halfway through a second bottle of vodka, and the best I could do was try to catch up. I was outclassed. Thin as a drinking straw, Alexei was an art critic, scholar, and collector of fine porcelains, an intellectual who became more animated with each round. Andrew was British but did business in Russia and stayed in practice vodka-wise, so to speak.

Right off the bat Alexei swore he had seen a video that caught the President of the United States as he stuck a wad of chewing gum under a table of inlaid stones at the Hermitage Museum. Alexei was sure that George W. Bush had declared war on Russian culture. It turned out he had just gone through the humiliating experience of being denied an American visa. He said the State Department as good as accused him of trying to sneak into the United States when it was the other way around. The United States was invading Russia through gentrification. There was even a neighborhood in Moscow that had banned Russian cars,



## the mafia, think of it as **alternative police.**

he'd heard. Only foreign cars were allowed!

Anyway, why would he want to be American, he asked? Moscow was safer at night than New York. He could walk around the center of Moscow at any hour, drunk or sober.

Alexei gave an example. A week ago he had visited an artist's studio. This artist had an interest in Nazi art, in its narcissism and banality. It was a deep discussion, and around two in the morning they ran out of vodka. They were nearly drunk, but Alexei knew a shop across town that was open. They walked blocks and blocks discussing Fascist paintings, sculpture, and architecture. At the shop they bought a few bottles, turned to leave, and found their way blocked by four skinheads tattooed with swastikas and portraits of Hitler. The biggest of the lot demanded to know why they were bad-mouthing the Führer. Alexei expected to suffer a beating, at least a little kicking and stomping, when the artist, although nearly drunk, opened a bottle, tossed aside the cap, and invited the skinheads to his studio. On the way they passed the bottle around while the artist held forth on modern art, starting with Cézanne. The lecture was so boring and the skinheads became so inebriated they couldn't walk unaided. So Alexei and the artist dumped them one by one in various courtyards, and that was the difference between being drunk and being nearly drunk.

What this had to do with the safety of Moscow's streets escaped me; but I was in no condition to give chase. Somehow it had gotten dark. Alexei opened a window to the background din of the city, which prompted me to ask if he'd ever heard about late-night racing of cars or motorcycles in Moscow. It was a stretch, but I asked.

"On the Garden Ring?" Alexei said.

That he knew even that much surprised me.

"Yes. The record time for a car to go completely around is six minutes."

"Five minutes," he corrected me.

"Have you...?"

"Nine minutes." He sighed for the glory that might have been. "I stopped for red lights."

**CASINO** Andrei Sychev looked out over the 220 slot machines, 30 gaming tables, sports bar, and VIP hall and confided that he felt like the captain of a sinking ship. As an employee of the Udarnik Casino he did not understand why City Hall wanted to shut it down and "kill a goose that lays nothing but golden eggs." Each slot, for example, generated a generous profit every month, and yet the government accused casinos of "moral damage," having closed some already and vowed to relocate others to "Las Vegas zones" on the far borders of the Russian Federation by the end of next year. To some, a Moscow night without the bright lights of casino marquees may seem like a year without spring, but officials have already closed hundreds of gaming sites large and small. Who would be next?

Some of Sychev's dealers had already jumped ship for employment with better security. This created a ripple effect because regular customers like to play with a favorite dealer.

Was the Udarnik Casino a criminal enterprise? Absolutely not, according to Sychev. That is, no more than any other enterprise. Maybe 10 percent. For their own protection everybody had a "roof." Don't think of it as the mafia, think of it as alternative police.

Alexei had told me that Americans would never understand Russia because Americans saw things as black or white, nothing in between, while Russians saw a gray area of perhaps 80 percent.

Which brings us to...

**THE MAYOR** Not since Stalin has anyone left his stamp on Moscow as much as Mayor Yuri Luzhkov. A sawed-off colossus, he raises skyscrapers with one hand and flattens historic neighborhoods with the other. The floodlights

## Americans will never understand Russia because they see

that illuminate Moscow's classical palaces at night are under his command. He garnishes the city with statues that infuriate the critics, whom he ignores. He is what Russians call a *muzhik*, a man of the earth, and, although he and Vladimir Putin have been rivals in the past, they seem to agree that gaudy casinos are out of step with Moscow's new maturity and dignity, even if Putin reportedly complains that he never knows what the skyline of Moscow will look like when he gets out of bed in the morning.

The feeling in Moscow is that Luzhkov may be corrupt, but he gets things done. When construction funds ran short for the behemoth Cathedral of Christ the Savior, the story goes, he didn't hesitate to shake down businessmen and mafia alike to finish the job. According to one estimate, in 2005 Russians shelled out \$316 billion in bribes. Why not a donation for a worthy cause?

It was a happy coincidence that a company owned by the mayor's wife, Yelena Baturina, landed so many construction contracts in the city. In fact, Baturina is the only woman among Moscow's billionaires.

**THREE STATIONS—PART TWO** Sasha and I took the pedestrian underpass from Kazan Station because the more distance between us and the Cat in the Hat the better, and it was reassuring to find two uniformed security men sitting in the walkway, even if one was reading a comic book and the other was asleep. The shop stalls in the tunnel were shuttered except for one window displaying mobile phones.

We emerged in front of Yaroslavl Station. It was 3 a.m., and all the civilians had retreated to the waiting rooms and ceded the night to vodka zombies, prostitutes, and teenage gangs too spaced from huffing glue to notice us.

Incredibly, with one step into the waiting hall we reentered the normal world. There were cafés, a bookshop, a playpen, closed, to be sure, but evidence of normal life. Normal people were asleep in chairs. Healthy babies curled up on their mothers' laps. In some parts of the world people share a river with crocodiles. You just had to be careful.

But there was more. Returning through the underpass we came upon two men robbing a drunk. One lifted the victim by the neck while the second went through his pockets, although the way the drunk flopped back and forth made the task difficult. We had to get around them to pass. Sasha placed himself on the inside, between the action and me. The security men stayed seated and watched with mild curiosity; they were paid to protect the window of mobile phones, nothing else.

What happened took ten seconds. Essentially, the thieves took the money and ran. They wrested a roll of bills from the drunk's inside jacket pocket, let him drop, and vanished up the stairs to the street.

The drunk spat blood and sighed. He rolled to a sitting position and waved off any help.

At night?

At Three Stations?

Nothing happened.

**DIAGHILEV** Amid clouds of smoke, strobe lights, and the deafening beat of house music, the new lords of oil, nickel, and natural gas arrived at Diaghilev with women as mute and beautiful as cheetahs on a leash.

In this cacophony a millionaire could expand and relax. For one thing, no guns are allowed inside Diaghilev. The club had a 40-man security force, and any customer who felt in dire need of protection was assigned a personal bodyguard. A bomb dog had sniffed the chairs, and a security briefing had alerted the staff about special needs,

▶ **How many billionaires** can you fit into a single city? Test your knowledge of today's Moscow at [ngm.com](http://ngm.com).

## things as black or white. Russians see a gray area of 80 percent.

such as guests from Iran who did not want to be photographed drinking champagne with scantily clad models. I had followed Yegor through a back door. How Yegor arranged my visit I did not know, but the chief of security was not pleased.

The club incorporated relentless sound, color, and motion. Psychedelic visions splashed across screens and vodka bars. A UFO and a crystal chandelier contested air space, and a contortionist added a touch of Cirque du Soleil. It was a simple system. Face control admitted more women than men and only enough guests to achieve critical mass. The more people who were turned away the more people who wanted to get in. The real Diaghilev was the fur-trimmed impresario who founded the Ballets Russes a hundred years ago. First of all, he was a showman. He would have loved this.

New Russians climbed to their VIP tables, waving to fellow New Russians and celebrities. Television personalities and Eurotrash leavened the mix, and soon the floor was so crowded people could only dance in place, something six-foot models in six-inch heels managed gracefully.

Yegor kept asking a question I finally understood over the din, "Are you happy? Did you get what you came for?"

I didn't know. Was this what millions of Russians died for in wars and prison camps? Had they faced down a KGB coup and dismantled an empire so a few gluttons could party through the night? Gogol had likened Russia to a troika of speeding horses, not a Bentley in a ditch.

Suddenly, the speakers went silent for a booming, "I love Moscow!"

On the runway an American singer had taken over the microphone. She was black—not many in Moscow—and she sang the blues. The boys on the VIP tier went on chatting at a shout and pouring each other cognac. Then the entire crowd joined in one refrain in English, "What are we supposed to do after all that we've been through?" I had no idea what song it was. They

sang it over and over. "What are we supposed to do after all that we've been through?"

Soon after Diaghilev was, in a time-honored tradition of nightclubs, gutted by fire. Now it is better than hot, it is legend.

**LIGHTS** On my last night in Moscow Yegor showed me the future.

We drove beyond the Garden Ring and followed the river to a dark industrial area, where we parked and walked along a chain-link fence. If this was the future, I wasn't impressed.

"Look up," Yegor said.

"I don't see anything."

"Look higher!"

Against the night stood a ladder of lights so high I couldn't be sure where it stopped, until a red beam crawled to the edge of an open floor somewhere near Mars.

"Moscow City," he said. "A city within a city."

It was a magic beanstalk, a complex of 14 buildings, including the Russia Tower, at 113 floors projected to be the tallest skyscraper in Europe. A giant crane performed a pirouette at the top of what will be the Moscow Tower, a mere 72 stories high. Work was going on day and night. A floodlight revealed figures in yellow vests clambering over the load the crane had delivered. From what seemed an incredible distance we heard the stutter of a rivet gun, the clap of metal plates, even voices, creating a curious intimacy.

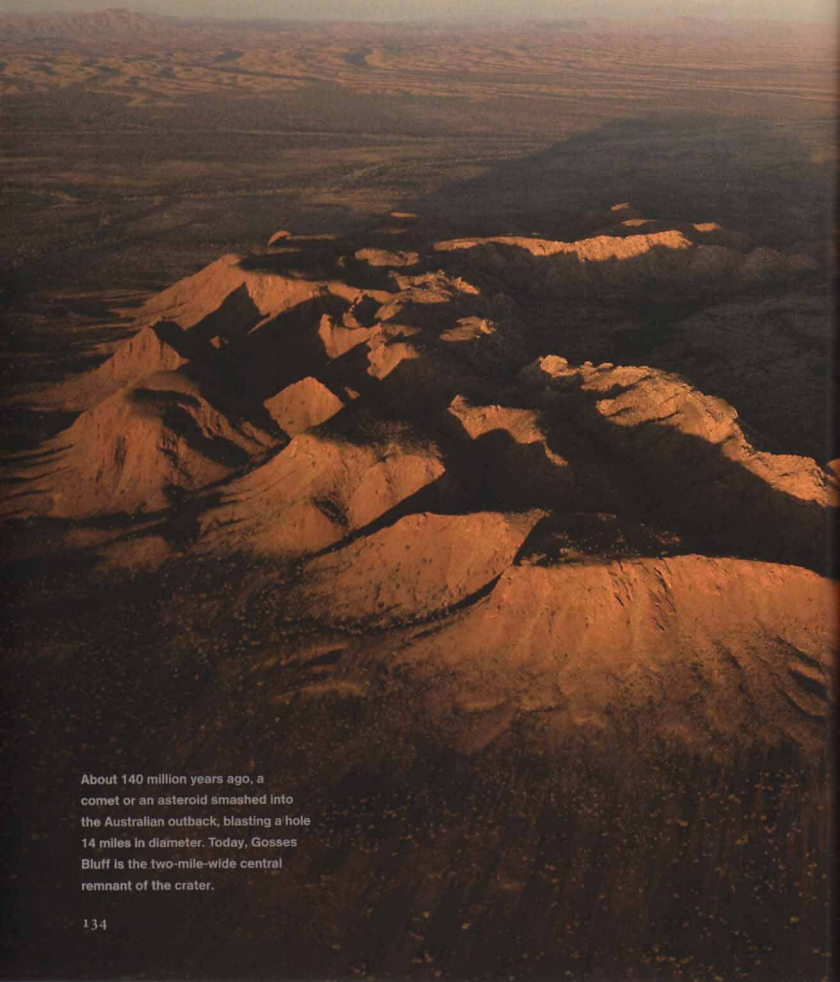
Buildings were in every stage of construction. Those already completed resembled silver spaceships about to depart. The scale was enormous. The excavation alone could swallow the pyramids of Giza. The complex is planned to house City Hall, offices, and luxury apartments with views halfway to Finland.

This is the advantage of being in Moscow after dark.

In the daytime you see only architecture.

At night you see blazing ambition. □

Asteroids and comets in nearby space pose a constant



About 140 million years ago, a comet or an asteroid smashed into the Australian outback, blasting a hole 14 miles in diameter. Today, Gosses Bluff is the two-mile-wide central remnant of the crater.



threat to our planet.

Can we avert catastrophe the next time around?

target

earth

# The first sign of the threat was no more than a speck on a star-streaked telescope image.

Just after 9 p.m. on June 18, 2004, as twilight faded over Kitt Peak National Observatory in Arizona, David Tholen was scanning for asteroids in an astronomical blind spot: right inside Earth's orbit, where the sun's glare can overwhelm telescopes. Tholen, an astronomer from the University of Hawaii, knew that objects lurking there could sometimes veer toward Earth. He had enlisted Roy Tucker, an engineer and friend, and Fabrizio Bernardi, a young colleague at Hawaii, to help. As they stared at a computer, three shots of the same swath of sky, made a few minutes apart, cycled onto the screen. "Here's your guy," said Tucker, pointing at a clump of white pixels that moved from frame to frame.

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*Richard Stone is Science magazine's Asia editor. Stephen Alvarez photographs expeditions and science for this magazine; his blog is at [picturestoryblog.com](http://picturestoryblog.com).*

Tholen reported the sighting to the International Astronomical Union's Minor Planet Center, a clearinghouse for data on asteroids and comets. He and Tucker hoped to take another look later that week, but they were rained out, and then the asteroid disappeared from view.

When astronomers got a fix on it again that December, they realized they had a problem. The rock, bigger than a sports arena, tumbles menacingly close to our planet every few years. As observations streamed into the Minor Planet Center, the asteroid, named Apophis after the Egyptian god of evil, looked increasingly sinister. "The impact hazard kept getting higher and higher," says Tholen. By Christmas, models predicted 1-in-40 odds that Apophis would smash into Earth on April 13, 2029, and a ripple of alarm spread to the public. "One colleague called it the grinch that stole Christmas," Tholen says.



### **SPOTTING DANGER**

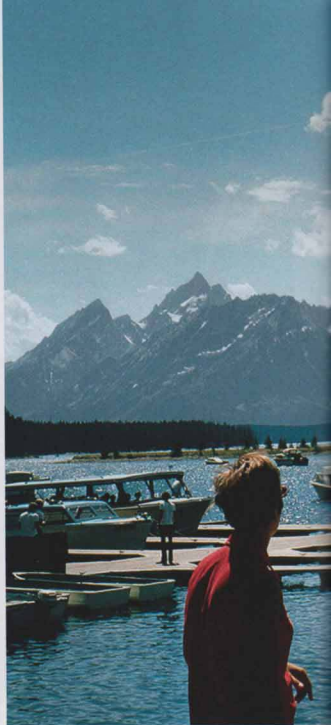
Asteroid hunters study time exposures of the sky, looking for objects that don't move with the stars. In 2004, they found one that came to be dubbed Apophis—the Destroyer in ancient Egyptian lore. This 900-foot-wide asteroid will zoom past the Earth in 2029 and again in 2036. Odds that pass will end in collision? Scientists now say 1 in 45,000.

Then on December 26, 2004, a real catastrophe struck: the Indian Ocean tsunami, which claimed hundreds of thousands of lives. The public forgot about Apophis. In the meantime, astronomers had dug out earlier images of the asteroid. The extra data enabled the scientists to calculate its orbit, and they discovered that it would actually whiz safely by Earth in 2029. But they could not rule out a slender chance that Apophis would strike with catastrophic effect its next time around, on Easter Sunday, 2036.

An estimated ten million rocky asteroids and ice-and-dirt comets pirouette in outer space, and once in a while their paths fatefully intersect our planet's. One such encounter took place a hundred miles from present-day Washington, D.C., where a 53-mile-wide crater lies buried beneath Chesapeake Bay—the scar left when a two-mile-wide rock smashed into the seafloor 35 million years ago. More notorious is the titan, six miles in diameter, that barreled into the Gulf of Mexico around 65 million years ago, releasing thousands of times more energy than all the nuclear weapons on the planet combined. “The whole Earth burned that day,” says Ed Lu, a physicist and former astronaut. Three-quarters of all life-forms, including the dinosaurs, went extinct.

Astronomers have identified several hundred asteroids big enough to cause a planetwide disaster. None is on course to do so in our lifetimes. But the heavens teem with smaller, far more numerous asteroids that could strike in the near future, with devastating effects. On June 30, 1908, an object the size of a 15-story building fell in a remote part of Siberia called Tunguska. The object—an asteroid or a small comet—exploded a few miles before impact, scorching and blowing down trees across 800 square miles. The night sky was so bright with dust from the explosion, or icy clouds from the water vapor it blasted into the upper atmosphere, that for days people in Europe could read newspapers outdoors at night. On Tunguska's hundredth anniversary, it's unsettling to note that objects this size crash into Earth every few centuries or so.

The next time the sky falls, we may be taken by surprise. The vast majority of these smallish bodies, capable of wiping a city off the map, are not yet on our radar screens. “Ignorance is bliss, in that if you don't know about these things, you just go about your merry way,” says Lu. Over the next decade, however, sky surveys like



Tholen's should begin filling that gap, cataloging asteroids by the thousands. “Every couple of weeks,” says Lu, “we're going to be finding another asteroid with like a one-in-a-thousand chance of hitting the Earth.”

The goal is not just to foretell the date and time of a potential catastrophe. The goal is to forestall it. With years or decades of warning, a spacecraft, using its own minuscule gravity, might nudge a threatening asteroid off course. For objects requiring a bigger kick, a kamikaze spacecraft or a nuclear bomb might do the job. Vexing dilemmas would attend this showdown in space. How will governments decide to act? “This is a class of problem that the world isn't set up to deal with,” says physicist David Dearborn, an advocate of a nuclear strike against an incoming asteroid.

Two facts are clear: Whether in 10 years or





500, a day of reckoning is inevitable. More heartening, for the first time ever we have the means to prevent a natural disaster of epic proportions.

EVERY DAY, DOZENS OF TONS of detritus from outer space—dust from comets, tiny shards of asteroids—burn up in the Earth's upper atmosphere, leaving bright meteor trails at night. Most days a chunk or two of rock or metal, fist size or bigger, survives the fiery plunge.

Yet the odds of seeing a meteorite hit the ground, let alone being struck, are phenomenally low. Only one is known to have hit a person. Around 1 p.m. on November 30, 1954, a meteorite tore through the roof of a house near Sylacauga, Alabama, across the street from the Comet Drive-in Theatre. The rock, about the size of a softball, caromed off a console radio and clipped

#### NEAR MISS

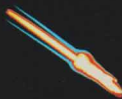
Streaking over Jackson Lake, Wyoming, in 1972, this 150-ton object skipped harmlessly off the atmosphere like a rock skipping off water. NASA classifies more than 950 much larger asteroids and comets as potentially hazardous because they stray uncomfortably close to Earth.

Ann Hodges as she snoozed on her couch, bruising her left hip and wrist. She was hospitalized to recover from the shock.

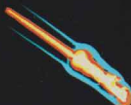
Since then, there have been some spectacular near misses. On August 10, 1972, an object around 15 feet across and weighing 150 tons skipped off the upper atmosphere. Hundreds of eyewitnesses



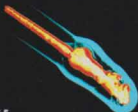
EXPLOSION  
BEGAN  
7.5 MI (12 KM)  
ABOVE GROUND



1.5 SECONDS LATER



3.5



5.5

### SPACE INVADER

A computer model of the 1908 event shows how an asteroid some 150 feet wide tore into the atmosphere at 32,000 miles an hour and began to explode.

### INCANDESCENT TRAIL

As the asteroid ripped through the air and vaporized, it left a trail of ultrahot gases.

# Siberian Blast

A new supercomputer simulation models the cataclysmic power of an asteroid strike.

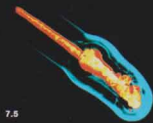


Just after 7 a.m. on June 30, 1908, an asteroid or comet exploded above Tunguska, Siberia, leveling trees (above) across 800 square miles. Models by Sandia National Laboratories researcher Mark Boslough show that the destruction could have been caused by an object—and an explosion—about half the size previously believed. Smaller objects strike more often, but Tunguska-level events are nevertheless rare.

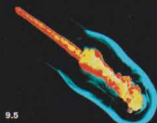


SEAN MCNAUGHTON, NG STAFF

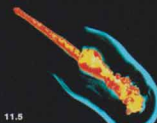
SIMULATION FRAMES: MARK BOSLOUGH, SANDIA NATIONAL LABORATORIES; TASS FROM SOVFOTO (ABOVE)



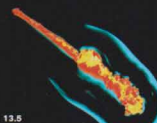
7.5



9.5



11.5



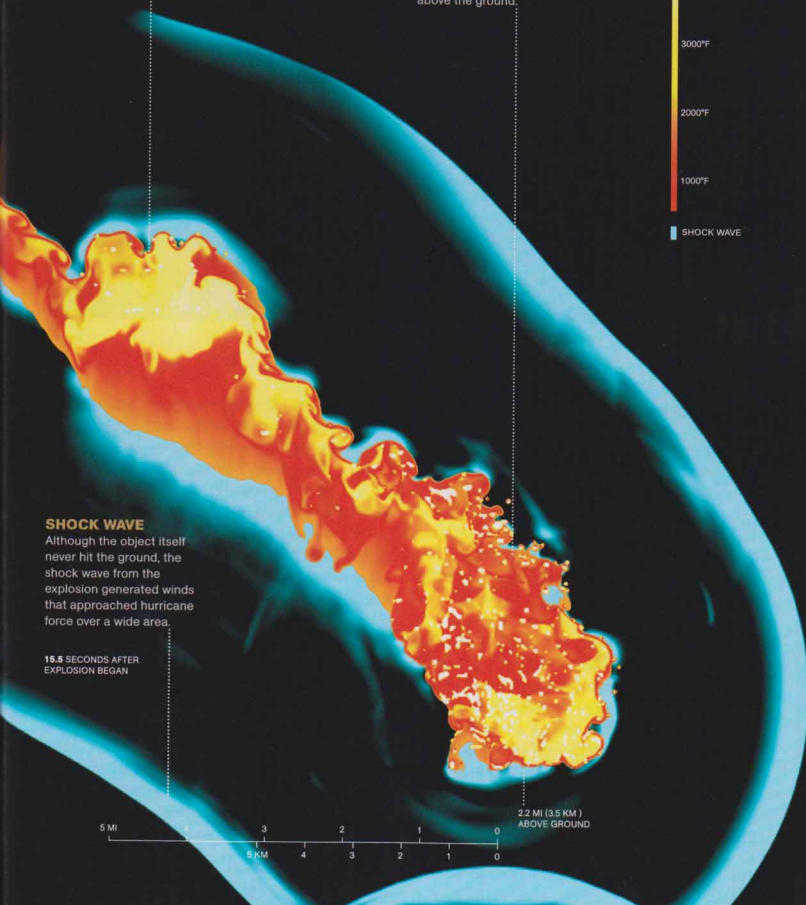
13.5

### MIDAIR BLAST

Glowing gases billowed from the exploding asteroid, forming mushroom clouds.

### SUPERHOT PILEUP

The increasing density of the atmosphere slowed the gases and debris. The remains of the asteroid dispersed well above the ground.



### SHOCK WAVE

Although the object itself never hit the ground, the shock wave from the explosion generated winds that approached hurricane force over a wide area.

15.5 SECONDS AFTER EXPLOSION BEGAN

5 Mi

4

3

2

1

0

5 KM

4

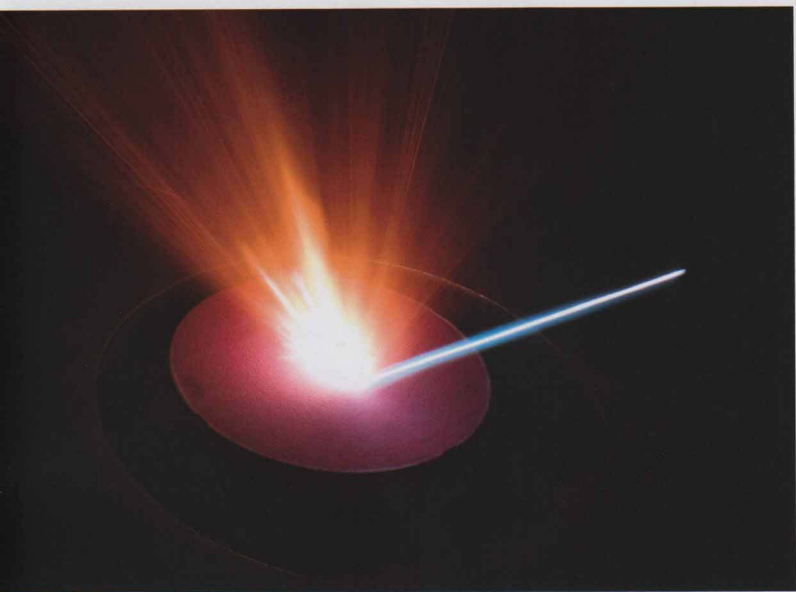
3

2

1

0

2.2 Mi (3.5 KM)  
ABOVE GROUND



## The number of experts working on deflecting objects would roughly staff a couple shifts at a McDonald's.

saw the glowing streak, dazzling on a sunny afternoon, as it traversed the sky from Utah to Alberta before whizzing back out into space. On March 22, 1989, a rock as much as a thousand feet across came within a few hundred thousand miles of Earth—an uncomfortably close shave.

Erosion and vegetation have erased most of the scars left by impacts in the geologic past. Perhaps the best preserved lies about half an

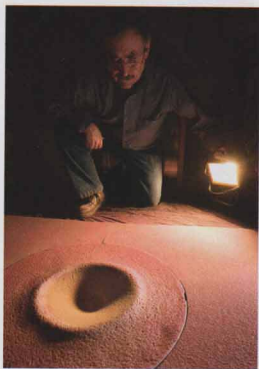
hour east of Flagstaff, Arizona. On a late autumn morning Carolyn Shoemaker and I pull off Interstate 40 and wind through scrubby desert toward a low rise marking the rim of the crater. Fifty thousand years ago this was a forested plain inhabited by mammoths, giant ground sloths, and other Ice Age animals. Shoemaker, an asteroid expert with the Lowell Observatory in Flagstaff, imagines the day the sky fell. "Suddenly, there's a terrific, brilliant light," she says. In a flash, a searing-hot iron-nickel mass, 150 feet wide and weighing 300,000 tons, tears into the Coconino sandstone, flinging boulders and molten iron for miles. A blast of wind more powerful than any earthly tornado scours the landscape.

All that's left of the cataclysm now is a chasm three-fourths of a mile wide and 570 feet deep, fringed with Mormon tea bushes. At the turn of the 20th century, an engineer named Daniel Moreau Barringer was convinced that a massive iron meteorite lay beneath the crater and obtained



## MODELING MAYHEM

Firing a tiny aluminum pellet into a sandpit at 12,000 miles an hour helps geologist Peter Schultz understand impact zones. "Standing downrange, you'd be broiled by the hot blast and pummeled by debris," he says. "Think of a hot landslide, without a mountain."



the mining rights to the land. But after a series of shafts revealed nothing, many prominent geologists concluded that a volcanic eruption, not a meteorite, had formed the crater.

Carolyn's husband, Gene, made Meteor Crater one of America's most recognizable landmarks. In the late 1950s he mapped the overturned rock around the crater and pointed out similarities to the Teapot Ess crater in Nevada, formed by a nuclear test. His data showed that Barringer was right: A meteorite had gouged the crater, although most of the iron had melted into tiny droplets. Several of Barringer's shafts can still be seen from the rim, along with a full-size cutout of a waving astronaut—a nod to NASA, which once used the crater as a training ground. Some visitors whisper and point at Carolyn, and one man plucks up the courage to come over and request her autograph. Carolyn is famous in her own right. She discovered a comet that, in 1994, vividly demonstrated the cosmic threat we face.

In 1980, their children grown and out the door, Gene suggested that Carolyn start a career as an asteroid hunter. "I'm a morning person," she says. "I had never stayed awake all night in my life. I didn't know if I could do that." But she decided to give asteroid hunting a shot. Gene had access to the Palomar Observatory near San Diego. "After a couple years, I learned how to discover things," she says, modestly. She has 32 comets and 367 asteroids to her credit. "Some are more interesting than others."

On March 25, 1993, Carolyn, Gene, and David Levy, an amateur astronomer, were at Palomar for their scheduled observation time. Snow was falling, and the night promised to be long and boring. Carolyn killed time by studying a batch of overexposed film from the previous night. Many frames were worthless. On one of the last images, however, she came across a smudge. "I said, 'It looks like a squashed comet.'" The team asked astronomers at Kitt Peak to take a look. It then occurred to Carolyn that her squashed comet might be a broken comet. Confirmation came that same night when Kitt Peak spotted a string of comet shards traveling together.

Other astronomers soon counted some two dozen pieces of comet Shoemaker-Levy 9 and worked out its strange history and fate. In July 1992, it seemed, the comet had swung so close to Jupiter that the giant's massive gravity had torn it apart. Now the remnants, some of them hundreds of feet wide, were destined to collide with Jupiter in July 1994. When the time came, most of the world's astronomers were watching.

The impacts took place on Jupiter's far side, out of sight of Earth, but the blows sent superheated gas billowing far above the atmosphere. The largest unleashed shock waves that roiled an area at least three times the width of Earth. "It was pretty awesome," Carolyn says. The Shoemakers basked in the glow of their discovery. Then tragedy struck. In 1997 they were in a head-on car crash in the Australian outback. Gene died at the scene. An ounce of his ashes traveled to the moon with NASA's Lunar Prospector spacecraft.

Carolyn scattered the rest at Meteor Crater.

IF THE SHOEMAKERS' NAMESAKE or the monster that annihilated the dinosaurs were bearing down on us, there would be little we could do. For every planet killer, however, there are thousands of smaller asteroids and comets—up to a mile

or so across—that could conceivably be deflected. First we'd have to see them coming.

In 1998 the U.S. Congress ordered NASA to identify at least 90 percent of the largest asteroids and comets in the inner solar system—objects six-tenths of a mile or more in diameter. To date, telescopes have pinpointed more than 700 out of an estimated population of 1,000. In 2005 Congress got more ambitious, directing the space agency to track down the far more numerous asteroids 460 feet or more in diameter—still big enough to take out a city or state.

A new telescope is about to begin scanning the sky for these dim, elusive objects. From a peak on Maui, the Panoramic Survey Telescope and Rapid Response System, or Pan-STARRS, will scrutinize the night sky with a 1.4-billion-pixel camera that produces images so detailed a single one, if printed, would cover half a basketball court. Computers will scan the data, flagging statistical curiosities that astronomers can check the old-fashioned way, by taking a look. The Maui telescope is just a prototype; ultimately, Pan-STARRS will include an array of four cameras. “We’ll have catalogs of all the things that go bump in the night,” says Ken Chambers of the University of Hawaii, including perhaps 10,000 potentially hazardous asteroids.

Within decades, the world’s leaders may be forced to grapple with a momentous decision: whether and how to deflect an incoming object. Few experts are giving this much thought, says astronomer David Morrison of NASA’s Ames Research Center: “The number would roughly staff a couple shifts at a McDonald’s.”

Lu, the former astronaut, is one. Now an executive at Google, he is helping design a massive database for a successor to Pan-STARRS, the Large Synoptic Survey Telescope, which will scrutinize the sky in even more detail starting in 2014. Lu is also the coauthor of a scheme for using a spacecraft to coax an earthbound asteroid off its dangerous path. “We were originally thinking about how you would land on an asteroid and push it,” he says. “But that doesn’t work well.” If the surface is crumbly, the lander might skid off. Moreover, asteroids swirl through space. “If you’re pushing and the thing is rotating, the pushing just cancels out,” Lu says.

Then he and Stanley Love, a fellow astronomer, realized pulling would be much easier. A spacecraft could hover nearby and fire its thrusters,

## BATTERED GIANT

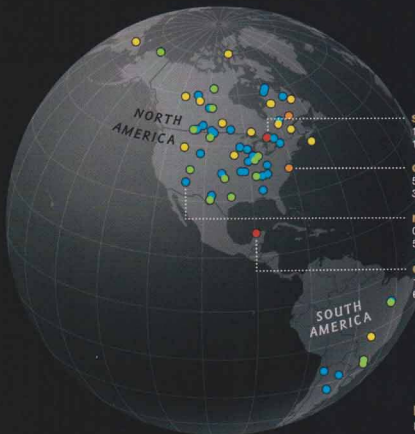
A string of roughly 20 fragments of comet Shoemaker-Levy 9 (composite view, below) hit Jupiter like machine-gun fire in July 1994. The impacts left bruises on Jupiter’s atmosphere (right), some of them wider than Earth, and gave astronomers their first look at a planetary collision.



gently tugging the asteroid along. No harpooning or lassoing would be required. “Rather than having a physical line between you and the thing you’re towing, you’re just using the force of gravity between them,” Lu says. The “gravity tractor” would tug the asteroid off course at a mere fraction of a mile an hour. But this subtle shift, magnified over the vastness of space, could mean missing Earth by tens of thousands of miles.

Lu’s scheme would work only for asteroids up to a few hundred yards across that could be engaged far from Earth. If a small rock sneaks up on us, we could try ramming it with a spacecraft. But there’s a drawback, says Morrison: “If you hit an asteroid with enough energy to break it apart, but not necessarily enough energy to disperse it widely, you now have a flying collection of stuff. You have to ask how practical that is.” When all else fails, and for large asteroids and comets, only one strategy has a chance of working: We’ll have to bomb them back to the Stone Age.





**SUDBURY**  
155 miles wide  
1.9 billion years ago

**CHESAPEAKE BAY**  
53 miles wide  
35 million years ago

**METEOR CRATER**  
0.73 miles wide  
50,000 years ago

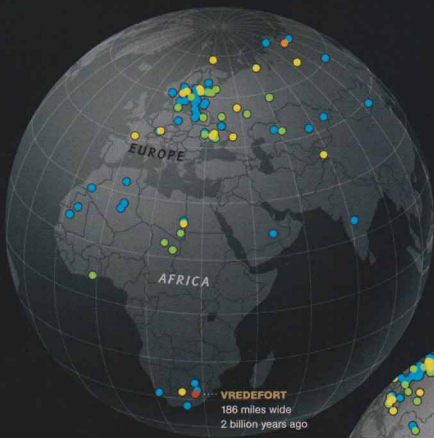
**CHICKXULUB**  
106 miles wide  
65 million years ago

### EARTH SCARS

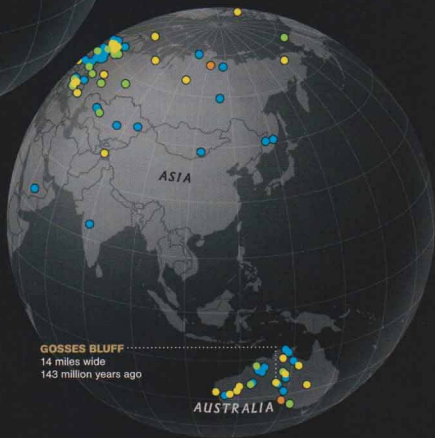
Using tools from satellite imagery to microscopic analysis of rocks and minerals, scientists have found traces of 174 meteorite impact sites. Many more have been obliterated by surface changes or lie hidden under the seas. The largest impact scars (red dots) represent events that had the power to transform landscapes, climate, and life itself across much of the planet.

### WIDTH OF CRATER

- More than 100 miles
- 51-100 miles
- 11-50 miles
- 5-10 miles
- Less than 5 miles



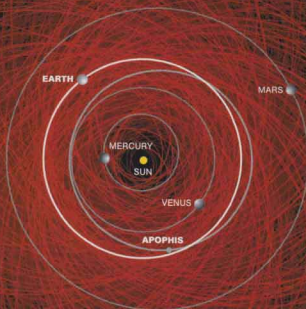
**VREDEFORT**  
186 miles wide  
2 billion years ago



**GOSSE BLUFF**  
14 miles wide  
143 million years ago

SEAN McNAUGHTON AND LISA R. RITTER, NG STAFF  
IMPACT SITES SOURCE: PLANETARY AND SPACE SCIENCE  
CENTRE, UNIVERSITY OF NEW BRUNSWICK, ORBITAL PATHS  
COURTESY PAUL CHODAS, NASA/JET PROPULSION LABORATORY





Orbital diagram of potentially hazardous asteroids and comets. All orbits are to scale.

# Heavy Traffic

Every year as the Earth loops through a solar system crowded with other bodies, there's a chance it could run into trouble.

So far more than 5,400 asteroids and comets have been spotted flying within 121 million miles of the sun—close enough to our planet for astronomers to classify them as near-Earth objects. Those that measure more than 460 feet across and pass within 4.6 million miles of Earth's orbit are considered potentially hazardous. As of April, astronomers had cataloged more than 950 such

bodies (red tracks)—including Apophis, an asteroid that will come within 21,000 miles of Earth in 2029. None of the known potentially hazardous objects are believed likely to collide with Earth. But observers are constantly monitoring their positions, recalculating their orbital paths and the impact risks they represent—and searching nearby space for new threats.

STANDS OF FROSTED FIRS and white birch cluster along the highway leading southwest from Yekaterinburg, the city in the Ural Mountains where Russia's last tsar, Nicholas II, and his family were murdered 90 years ago. Under a dull sun, fishermen huddle over holes on a frozen lake, floppy-eared fur hats hiding their faces. A road with a misspelled signpost for a tiny village marks the turnoff for the formerly secret city of Snezhinsk, code-named Chelyabinsk-70 during the Cold War. Snezhinsk is home to one of Russia's two main nuclear weapons laboratories. After the collapse of the Soviet Union, it fell on hard times; ten years ago, with Russia's economy in shambles, staff salaries went unpaid, and the director committed suicide.

Nowadays, with Russia prospering, the laboratory is humming with top secret work. Obtaining permission to enter proved impossible. But Vadim Simonenko, the deputy scientific director, and experimentalist Nikolay Voloshin agreed to meet at a sanatorium in nearby Dalnyaya Dacha. In a cool, dim, and empty dining hall, Voloshin opens a bottle of cognac, and over salmon canapés, cold cuts, and sliced cucumbers, the two weapons scientists discuss how their bombs could save the world.

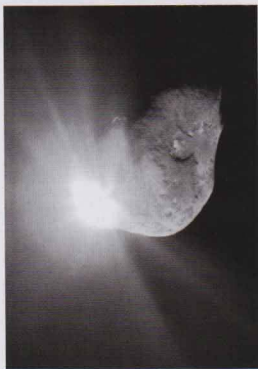
If Edward Teller is the father of the hydrogen bomb, Simonenko is the father of the asteroid bomb. In the mid-1960s the superpowers dreamed of using their nuclear arsenals for peaceful purposes, such as leveling mountains and digging canals. Simonenko, a new recruit to the lab, was asked to study the effects of a torpedo-shaped charge that would explode laterally, ideal for earthmoving. It occurred to him that such a device could also be used to deflect an object in space. He told his boss, who laughed and ordered the eager young physicist to get back to work.

Though nuclear excavation never became a reality, Simonenko went on studying nuclear asteroid deflection. He and Voloshin concluded that the best way to deflect an asteroid up to a mile or so wide would be to detonate a nuclear charge nearby. The intense radiation would fry the surface, driving off a "sacrificial layer" of rock. The expanding vapor would act as a rocket motor, nudging the asteroid onto a new trajectory. For a smaller, Tunguska-size rock, Simonenko says, "it would be simpler: We vaporize it."

Simonenko has a brother-in-arms in nuclear

## DISASTER PLANNING

In 2005, a NASA spacecraft probed a comet by smashing into it (below) with the force of five tons of dynamite—yet barely shifted its path. Scientist James Szabo (right) develops plasma thrusters that could propel a "gravity tractor" to tug a threatening comet or asteroid to a safer orbit.



physicist David Dearborn of Lawrence Livermore National Laboratory in northern California. Dearborn's day job is determining whether the aging weapons in the U.S. nuclear stockpile are reliable. In his spare time, he ponders asteroid defense. He, too, favors a standoff nuclear blast. "Not too close—then the blast is too intense, and things shatter too much. And not too far, or you don't get enough energy."

Although it may be technically straightforward to dust off a few warheads and sling them at an asteroid, deciding whether to press the red button—and which nation gets to press it—could be excruciating. First, the nation with its finger on the trigger would have to withdraw from the Outer Space Treaty, which bans the use of nuclear weapons in space. But if catastrophe looms, says Dearborn, "people would really have to say, 'Can we be brighter than the dinosaurs?'"

Apophis may pose the first real test of our collective intelligence. For now, scientists can give



## For large objects, only one strategy has a chance of succeeding: We'll have to bomb them back to the Stone Age.

only a range of probabilities for its future trajectory. As it swings past Earth in 2029, ducking under dozens of high-flying communications and spy satellites and appearing as a bright star lumbering across the night skies over Europe, there's a slim chance that Apophis will pass through a "keyhole." In this narrow corridor of space, maybe a few hundred yards wide, Earth's gravity would deflect the asteroid just enough to put it on a certain collision course with our

planet on the next pass, in 2036. The odds that Apophis will pass through this fatal corridor are currently estimated at 1 in 45,000. Continued tracking will almost certainly deliver an all clear a few years from now. If not, we might have to wait until weeks after its close approach in 2029 to learn whether Apophis has squeezed through a keyhole, leaving us precious little time to avert calamity in 2036.

In the prophesies of the Hopi of the American Southwest, the arrival of a spirit called Yellow Star Kachina will herald the end of the world. When Hopi elders heard about Apophis in 2004, they worried that Yellow Star Kachina was on its way. Carolyn Shoemaker tried to reassure them that it was not.

Let's hope she was right. □

📍 **Interactive Map** Learn where meteorites have crashed to Earth over geologic history and see the scars they left, at [ngm.com](http://ngm.com).



## FOLLOW UP

**ISLAND ARK, PAGE 68** **Bioko Island Journal** Joel Sartore, with three other *National Geographic* photographers and a crew of students and scientists, spent two weeks on this speck of land documenting the region's rich array of wildlife. These are some of Sartore's notes from time spent in Malabo, Equatorial Guinea's capital city—and the center of a thriving bush-meat trade.

### MY FIRST DAY IN MALABO

Today I got punched in the mouth by a monkey. It was a drill, actually, the largest primate species on Bioko Island. A hunting orphan, he'd been welded into a rebar cage behind a small café. I leaned in too close to get a photo, and he tore up my mouth with one jab. It served me right. The café's owner had recently died. There are no zoos around to take drills, and because they are an endangered species, they can't be exported without major paperwork. I have a feeling this drill may end up being eaten.

### MY LAST DAY IN MALABO

This morning I went to the bush-meat market. I'm from Nebraska, and I've seen butchering. This was different. Here were baskets of hornbills, tables covered with pangolins, pythons, brush-tailed porcupines, and rats. I'd seen snares set everywhere in the forest; this was their harvest. A small blue duiker lay bound and alive. The woman selling it yelled when I brought the camera up to my face, so I took three shots from the hip using a trigger on the bottom of the camera, coughing each time to hide the sound of the shutter. Slaughtered animals would eventually be carried over to metal tables where men would torch the hide or feathers. The whole place smelled of burning hair. I bribed the torch men to let



Photographer Joel Sartore took this picture of a drill—and then took a punch in the face. See more of his *Bioko* journal at [ngm.com](http://ngm.com).

me shoot; a four-dollar phone card bought me half an hour.

A law passed in 2007 made it illegal to kill, sell, or consume primates in Equatorial Guinea. But with a desperately poor populace and a single monkey selling for \$200 or more, how can this hold? As I stood in

the market, one of the torch men motioned to a big male drill, about the size of my four-year-old son. The dead animal's hand was held in the flame.

It looked just like mine.

➔ You can support efforts to save Bioko's wildlife at [bioko.org](http://bioko.org).



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The  
Economist

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FORTUNE

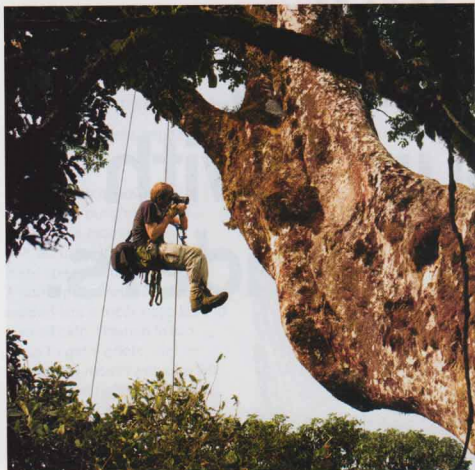
Herald Tribune

NATIONAL  
GEOGRAPHIC

Newsweek

TIME

THE WALL STREET JOURNAL



Tim Laman uses tree-climbing gear to take a landscape shot.

#### ON ASSIGNMENT

### Photo Blitz

Taking pictures for the *Geographic* is often a solitary experience, but it wasn't so on Bioko. Four members (below) of the International League of Conservation Photographers took on the island off West Africa together. Tim Laman and Christian Ziegler hiked up into a caldera to look for primates, while Joel Sartore and Ian Nichols stayed near the beach.

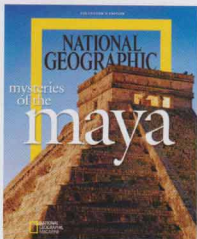
They still worked alone, but observed each other's techniques. "We all got along really well, and we enjoyed sharing ideas," says Laman. They also put their photos to work for conservation right away: Only days after finishing the shoot, they assembled a slide show about Bioko's biodiversity for local dignitaries.



Photographers Christian Ziegler, Ian Nichols, Joel Sartore, Tim Laman, and writer Virginia Morell take a rare break.



A fifth-century incense burner depicts a Maya god holding a human head.



COLLECTOR'S EDITION

## Maya Wonders

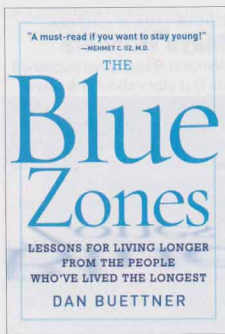
*National Geographic* published its first story about the Maya in its March 1913 issue, a report on the excavation of mysterious temples in the jungles of Guatemala. The lost civilization has continued to fascinate. Recent decades have brought new understanding of its culture. Far from the peaceful stargazers once imagined, the Maya had "a magnificent Classic civilization that went down in great violence and destruction," says *Geographic* senior writer Ann Williams, who worked on the new special issue, *Mysteries of the Maya*. It covers 2,000 years of Maya history, tracing the civilization's rise and fall, including its early agrarian days and the Postclassic flowering at sites like Chichén Itzá on the Yucatán Peninsula. The publication is on newsstands August 12 (\$10.95).



Josh Thome and Sol Guy want to change the world.

## They're 4REAL

National Geographic's new Emerging Explorers Sol Guy and Josh Thome make saving the world look cool. On each segment of their TV series *4REAL*, Guy takes celebrities like Cameron Diaz and Joaquin Phoenix around the globe to meet community organizers who are making a difference. One program introduces a Quechua medicine man in Peru preserving his culture; another features an activist for children in postwar Liberia. *4REAL* airs internationally on National Geographic Channel and Nat Geo Adventure; check local listings for times.



**NG BOOKS** **Live Long and Happily** The stars of the new book *The Blue Zones* live in four places where people enjoy extraordinarily long lives: in a mountainous part of Sardinia, on Japan's subtropical Okinawa, on the Nicoya Peninsula of Costa Rica, and in the Seventh-day Adventist community around Loma Linda, California. Author Dan Buettner finds common threads among them and offers advice (below) for longevity (\$26).

- **Have Purpose** Nicoyans call it *plan de vida*—a reason to live makes life longer (and better).
- **Be Active** It doesn't have to be marathons. Many Sardinian men herd sheep, but anyone can make movement routine.

- **Eat Plants** Blue Zoners eat little meat; historically, most didn't have access to it. Adventists advocate a vegetarian diet.
- **Family First** Okinawans honor their ancestors daily and live with multiple generations.

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**Banner Night** Slogans honoring writer Maksim Gorky draped balconies at Moscow's Bolshoi Theatre in 1928. The photo appeared in the May 1930 *Geographic* article "Some Impressions of 150,000 Miles of Travel," by William Howard Taft. The former President—a long-time National Geographic Society board member—mentions seeing a "beautiful children's ballet" during a visit to the Bolshoi years before the Russian Revolution. But unrest was already in the air. During the same trip, he says of a military companion, "We never entered an anteroom where...the General, in humorous reference to the possibility of being blown up, did not suggest an examination of the ceiling to see whether it was of such material as to make our passage through it a comfortable one." —Margaret G. Zackowitz

Flashback Archive Find all the photos at [ngm.com](http://ngm.com).

PHOTO: PRESS-CLICHE RUSSIAN NEWS PHOTO AGENCY/NG IMAGE COLLECTION

NATIONAL GEOGRAPHIC (ISSN 0027-9358) IS PUBLISHED MONTHLY BY THE NATIONAL GEOGRAPHIC SOCIETY, 1145 17TH ST. NW, WASHINGTON, DC 20036-4688 \$49.50 A YEAR, \$7.50 PER SINGLE COPY (INCLUDES POSTAGE AND HANDLING). PERIODICALS POSTAGE PAID AT WASHINGTON, DC, AND AT ADDITIONAL MAILING OFFICES. POSTMASTER: SEND ADDRESS CHANGES TO NATIONAL GEOGRAPHIC, PO BOX 80002, TAMPA, FL 33683-3002. REPR. EN FRANCE: EMO FRANCE SA, BP 1029, 59011 LILLE CEDEX, TEL. 320.300.302; CPAP NO. 0710U69037; DIRECTEUR PUBLICATION: TASSINARI DOMENICO DIR. RESP. ITALIA: RAPPR. IMD SRL, VIA G. DA VELATE 11-20162 MILANO; AUT. TRIB. MI N. 258 26/5/84. SPED. ABB. POST. 45% ART. 2 COMMA 20/B LEGGE 23/12/96 N.662 MILANO STAMPATA QUAD/GRAPHICS, MARTINSBURG, WV 25401. MEMBERS: IF THE POSTAL SERVICE ALERTS US THAT YOUR MAGAZINE IS UNDELIVERABLE, WE HAVE NO FURTHER OBLIGATION UNLESS WE RECEIVE A CORRECTED ADDRESS WITHIN TWO YEARS. EUROPEAN EDITION



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