

# ALEXANDRA CROOK

NAME: ALEXANDRA CROOK  
AGE: 17  
HOME: SALT LAKE CITY, UT  
SCHOOL: BOA ELDER HIGH SCHOOL  
INVENTION: AN INEXPENSIVE MICROGRAVITY ENVIRONMENT



ALEXANDRA ALWAYS LIKED TO LINE THINGS UP. SHE ARRANGED HER DOLLS AND HER BATHTUB TOYS.



ALEXANDRA HAS ALSO LOVED SOLDERING AND WELDING IN THE GARAGE WITH HER DAD. SHE IS NOW A "CERTIFIED WELDER".



HER SKILLS DON'T STOP THERE. HER HOBBIES INCLUDE PLAYING VOLLEYBALL, FLY FISHING, RUNNING MARATHONS, AND ESPECIALLY SHOOTING. SHE HUNTS BOTH SMALL AND LARGE GAME AND IS GREAT WITH BOTH A RIFLE AND A PISTOL.



WHEN ALEXANDRA WAS 10, SHE USED HER ENTREPRENEURIAL SPIRIT TO CREATE A "PET SITTING BUSINESS". WHEN THE HAMSTERS, GERBILS, AND OTHER RODENTS BECAME TOO MUCH, HER VENTURE ENDED.



HER INTEREST IN MICROGRAVITY BEGAN IN THE 7<sup>TH</sup> GRADE, AND SHE CONTINUED TO IMPROVE HER INVENTION UNTIL SHE GRADUATED.

HER INVENTION, "AN INEXPENSIVE MICROGRAVITY ENVIRONMENT" WON THE INTEL ISEF 2007 AWARD, THE UNITED TECHNOLOGIES CORPORATION EXCELLENCE IN SCIENCE & ENGINEERING AWARD, AND THE OFFICE OF NAVAL RESEARCH, NAVAL SCIENCE AWARD - U.S. AIR FORCE 1<sup>ST</sup> PLACE IN SCIENCE & ENGINEERING.

SHE IS PRESENTLY A SOPHOMORE AT THE UNIVERSITY OF UTAH WHERE SHE IS STUDYING MECHANICAL & SYSTEMS ENGINEERING. ALEXANDRA WOULD LIKE TO CREATE MILITARY WEAPONRY AND POSSIBLY WORK AT THE OFFICE OF NAVAL RESEARCH.



# SHIV GAGLANI

NAME: SHIV GAGLANI  
 AGE: 16  
 HOME: MELBOURNE BEACH, FL  
 SCHOOL: WEST SHORE JUNIOR SENIOR HIGH SCHOOL  
 INVENTION: A NOVEL RAPID PROTOTYPING APPROACH TO TISSUE ENGINEERING



SHIV WAS BORN IN WINDHOEK, NAMIBIA. HIS FAMILY THEN MOVED TO SOUTH AFRICA WHERE HE LIVED FOR FIVE YEARS WHILE HIS FATHER WORKED AS A GENERAL PRACTITIONER, SPECIALIZING IN PEDIATRICS.



SHIV QUICKLY DISCOVERED HIS INTEREST IN SCIENCE WHEN HE FOLLOWED HIS FATHER TO WORK WITH CHILDREN IN THE PEDIATRIC UNIT. SHIV DEVELOPED AN INTEREST IN MEDICINE AND EMPATHY FOR OTHERS.



HIS FAMILY THEN MOVED TO FLORIDA WHERE HIS PASSION FOR SCIENCE AND MEDICINE CONTINUED TO GROW THROUGH ELEMENTARY AND MIDDLE SCHOOL. IN HIS FREE TIME, HE ENJOYED READING, PLAYING FOOTBALL AND TENNIS, SCUBA DIVING, AND FLYING.



SHIV READ BOTH "POPULAR SCIENCE" AND "DISCOVER". BY READING THE ARTICLE, "PRINT ME A PANCREAS PLEASE", HIS LIFE REACHED A MAJOR TURNING POINT. THIS ARTICLE DESCRIBED NOVEL TISSUE ENGINEERING RESEARCH INVOLVING MODIFICATION OF OFF-THE-SHELF INKJET PRINTERS TO PRINT OUT LIVING CELLS IN A "BIOPINK" SOLUTION.

SHIV WAS PERSISTENT IN TRYING TO CONTACT RESEARCHERS IN SOUTH CAROLINA AT BOTH THE MEDICAL UNIVERSITY OF SC AND CLEMSON UNIVERSITY, WHERE HE WAS EVENTUALLY SUCCESSFUL IN REACHING MENTORS WHO WERE INSTRUMENTAL IN ADVANCING HIS OWN IDEAS.

HE HAS WON MANY AWARDS, INCLUDING THE INTEL SCIENCE & ENGINEERING FAIR, THE NATIONAL COLLEGIATE INVENTORS & INNOVATORS ALLIANCE (NCIIA)/LEMELSON FOUNDATION LIFE SCIENCES AWARD, AND IS PRESENTLY CREATING THE HARVARD COLLEGE UNDERGRADUATE RESEARCH ASSOCIATION (HOURA).

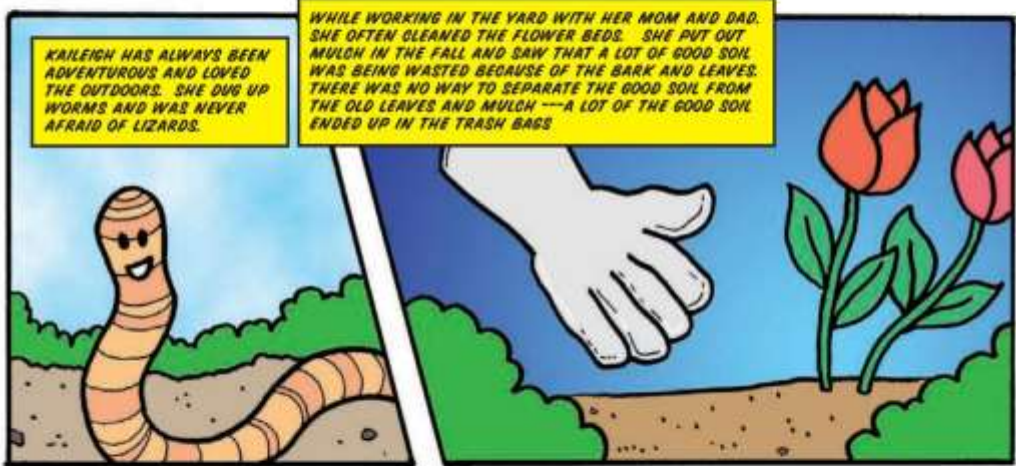
THIS PAST SUMMER SHIV WENT TO JAPAN TO STUDY NANOTECHNOLOGY AND TISSUE ENGINEERING OUT OF NANOTUBES.

SHIV IS PRESENTLY A JUNIOR AT HARVARD WHERE HE IS STUDYING BIOMEDICAL ENGINEERING WITH A FOCUS ON STEM CELLS AND TISSUE ENGINEERING. HE HOPES TO MAKE A DIFFERENCE IN THE WORLD BY REGENERATING ORGANS.



# KAILEIGH KIRTON

NAME: KAILEIGH KIRTON  
AGE: 9  
HOME: JACKSONVILLE, FL  
SCHOOL: ALMADANI ELEMENTARY  
INVENTION: THE SIFTING SHOVEL



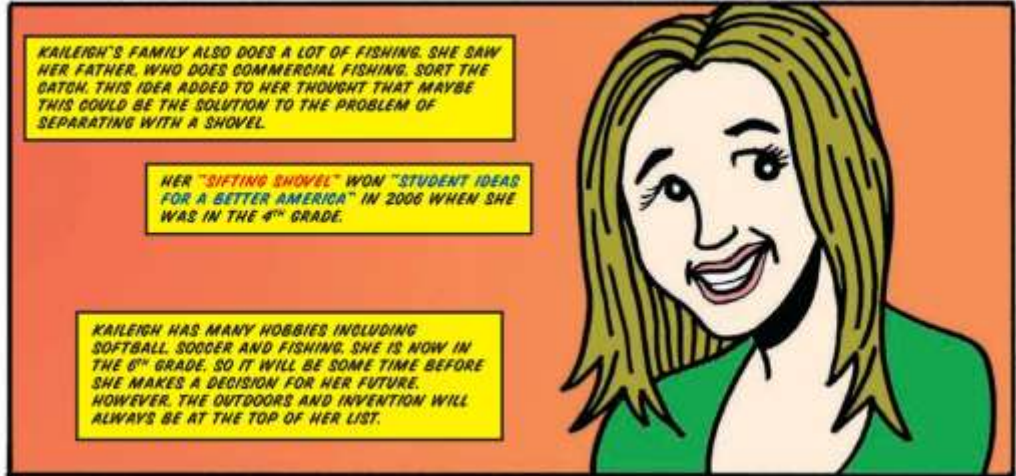
KAILEIGH HAS ALWAYS BEEN ADVENTUROUS AND LOVED THE OUTDOORS. SHE DUG UP WORMS AND WAS NEVER AFRAID OF LIZARDS.

WHILE WORKING IN THE YARD WITH HER MOM AND DAD, SHE OFTEN CLEANED THE FLOWER BEDS. SHE PUT OUT MULCH IN THE FALL AND SAW THAT A LOT OF GOOD SOIL WAS BEING WASTED BECAUSE OF THE BARK AND LEAVES. THERE WAS NO WAY TO SEPARATE THE GOOD SOIL FROM THE OLD LEAVES AND MULCH --- A LOT OF THE GOOD SOIL ENDED UP IN THE TRASH BAGS



BUT "EUREKA!" SHE REMEMBERED HOW SHE SEPARATED THE SHELLS FROM THE SAND AT THE BEACH USING THE LITTLE SIFTER THAT COMES WITH THE BUCKET SET.

IN ADDITION, ONE OF KAILEIGH'S CHORES WAS TO CLEAN THE KITTY LITTER. SHE REALIZED THAT A SIFTING SHOVEL WOULD BE VERY HELPFUL THERE TOO.



KAILEIGH'S FAMILY ALSO DOES A LOT OF FISHING. SHE SAW HER FATHER, WHO DOES COMMERCIAL FISHING, SORT THE CATON. THIS IDEA ADDED TO HER THOUGHT THAT MAYBE THIS COULD BE THE SOLUTION TO THE PROBLEM OF SEPARATING WITH A SHOVEL.

HER "SIFTING SHOVEL" WON "STUDENT IDEAS FOR A BETTER AMERICA" IN 2006 WHEN SHE WAS IN THE 4<sup>TH</sup> GRADE.

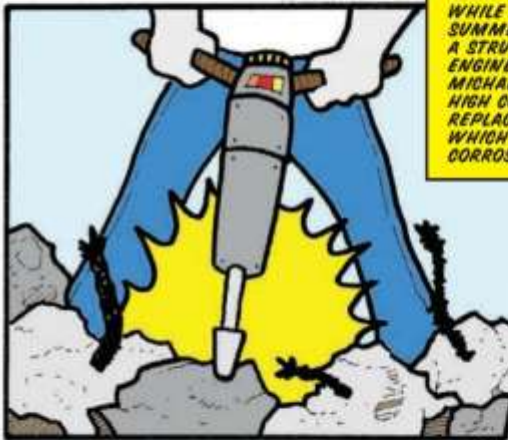
KAILEIGH HAS MANY HOBBIES INCLUDING SOFTBALL, SOCCER AND FISHING. SHE IS NOW IN THE 6<sup>TH</sup> GRADE. SO IT WILL BE SOME TIME BEFORE SHE MAKES A DECISION FOR HER FUTURE. HOWEVER, THE OUTDOORS AND INVENTION WILL ALWAYS BE AT THE TOP OF HER LIST.

Copyright 2008 NMoe



# michael loy

NAME: MICHAEL LOY  
AGE: 17  
HOME: PORTLAND, OR  
SCHOOL: OREGON EPISCOPAL SCHOOL  
INVENTION: DEVELOPING A NOVEL PH BUFFER METHODOLOGY  
TO INHIBIT CONCRETE CORROSION



WHILE WORKING AS A SUMMER INTERN WITH A STRUCTURAL ENGINEERING COMPANY, MICHAEL NOTICED THE HIGH COSTS OF REPLACING CONCRETE WHICH SUFFERED CORROSION DAMAGE.



HE DID SOME RESEARCH AND FOUND ONE REFERENCE TO THE EFFECTS OF PH ON CORROSION OF THE REBAR IN CONCRETE.



MICHAEL DESIGNED A SERIES OF EXPERIMENTS WHERE VARIOUS AMOUNTS OF BASIC BUFFERS WERE ADDED TO REINFORCED CONCRETE. SAMPLES WERE EXPOSED TO HIGH CHLORIDE AND CARBONIC ACID TO SIMULATE REAL WORLD CORROSION. PERIODICALLY, SAMPLES WERE TESTED FOR STRENGTH AND OTHER PROPERTIES.

HE FOUND A BUFFER THAT IMPROVED THE RESISTANCE TO CORROSION OVER THE FIRST YEAR OF TESTING. BEFORE HIS INVENTION WILL BE ACCEPTED BY THE CONSTRUCTION INDUSTRY AND BUILDING STANDARDS ORGANIZATION'S, OVER 10 YEARS OF EXPOSURE TESTING WILL BE NEEDED.



THIS STUDY WON MICHAEL A 2<sup>ND</sup> PLACE GRAND AWARD IN THE 2008 INTEL INTERNATIONAL ENGINEERING AND SCIENCE FAIR, MATERIALS SCIENCE AND BIOENGINEERING.

AFTER GRADUATION FROM HIGH SCHOOL, MICHAEL WILL STUDY ENGINEERING AT A WEST COAST COLLEGE CLOSE TO WHERE HE CAN SKI OCCASIONALLY. HE ALSO HOPES TO HAVE TIME TO ENJOY PLAYING HIS ELECTRIC BASS GUITAR.

# Theresa Ann Oei

NAME: THERESA ANN OEI  
 AGE: 14  
 HOME: HEBRON, CT  
 SCHOOL: EAST CATHOLIC HIGH SCHOOL  
 INVENTION: USE OF SEASHELLS TO DETOXIFY  
 LEAD-CONTAMINATED EFFLUENT AND GROUNDWATER

THERESA COMES FROM A VERY RICH CULTURAL BACKGROUND. HER INTERESTS INCLUDE READING CLASSICAL LITERATURE, PLAYING THE PIANO, AND MOST OF ALL DANCING. SHE WAS A BALLERINA WITH THE CONNECTICUT CONCERT BALLET WHERE SHE DANCED THE "NUTCRACKER". THERESA HAS ALSO DONE IRISH STEP DANCING FOR 10 YEARS AND HAS COMPETED NATIONALLY AND INTERNATIONALLY, RECEIVING AWARDS IN BELFAST, IRELAND AND GLASGOW, SCOTLAND.



EACH SUMMER THERESA AND HER FAMILY VACATIONED AT STONE HARBOR, N.J. IT WAS THERE THAT SHE BEGAN TO BE INTERESTED IN SEASHELLS. HER INTEREST FROM A YOUNG AGE DEVELOPED INTO RESEARCH ON CALCIUM CARBONATE TO REMOVE LEAD FROM WATER.



HER RESEARCH ON SEASHELLS WAS DONE AT HOME, AND HER TESTING WAS SENT TO A LAB IN FLORIDA WHERE HER WATER SAMPLES WERE CHECKED FOR THE AMOUNTS OF LEAD CONTAMINATION. THERE THEY USED A SCANNING ELECTRON MICROSCOPE TO TAKE PHOTOS OF THE SEASHELLS.

HER INVENTION, "USE OF SEASHELLS TO DETOXIFY LEAD-CONTAMINATED EFFLUENT AND GROUNDWATER", WON THE INTEL SCIENCE & ENGINEERING FAIR IN 2008, AND THE DISCOVERY CHANNEL YOUNG SCIENTIST CHALLENGE IN 2006.

THERESA PLANS TO ATTEND COLLEGE AND TO MAKE A CONTRIBUTION TO SOCIETY THROUGH EXPLORATION, INVESTIGATING, AND DOING RESEARCH TO HELP PEOPLE AND PROTECT THE ENVIRONMENT.



Copyright 2008 NMOE