A strange thing happened when Professor Robert Reisz attempted to earn a degree in physics in the mid-1980s. “I hated it,” Reisz said, cringing. “In high school physics was really fascinating, but in university it was just awful and dull.”

As he wrestled with what educational direction to pursue, after taking various courses at McGill, his curiosity was piqued by a course being offered on fossils. “I took it and just loved it and that was it,” Reisz said.

Reisz completed his studies at McGill and worked at University of California at Los Angeles for a year before accepting a faculty position at the University of Toronto.

In 1979 to 2004. He found that

Kent Moore, chair of the chemical

University of Toronto

now a fourth-year student at

the St. George campus last sum-

mothers and polynyas (embayments — known as embayments — tend

large bodies of water

weather system. Geddes deter-

the formation of sea ice

variables. Moore said, adding that

Great southwestern conglomeration of turtles and his work will

He has chosen to study the ori-

tertiary vertebrate life that is

climate record.

Reisz and his research team

attempt to piece together a
clearer picture of what these
animals looked like, how they
behaved, who their relatives
and descendants are and
reconstruct their evolutionary
history. Reisz pointed out that
310-350 million years ago all
the terrestrial vertebrate life
was on one large superconti-
cent called Pangaea and that
the fossils of animals have been found along the equator,
which extended from New
Mexico, Texas, Nova Scotia,
England and central Europe.
At this time there was also a
huge ice age that covered most
of the southern part of the
supercontinent, freezing up
South America, Africa, India
and Antarctica, but when the
ice age ended the fauna appear
to have spread everywhere.

“So I’m going all over the
world looking for these fossils,”
said Reisz. “I have studied mate-
tial from North America, Europe,
Russia, South Africa and I’m currently working
on material from Argentina.

As part of the Humboldt Research Award, which annually
honors internationally recognized
scientists and scholars from
abroad for career-long achieve-
ments in research and teaching,
Reisz will be given the opportu-
nity to pursue a research project
of his own design in Germany.
He has chosen to study the ori-
gin of turtles and his work will
be carried out at the Stuttgarter
Museum of Natural History.

Having started out without a
clear direction, Reisz has man-
aged to carve out a niche work
that has proven to be inspiring,
rewarding and even pleasurable
for him. He considers his
research to be a career-long
approach to vertebrate paleon-
tology and he is always looking
forward to the next project and
the discoveries that might be

Paleontologist Makes No Bones About Passion for Fossils

By Carla DeMarco

Antarctic Ice Yields Student Research Discovery

By W.D. Lighthall

While researching the “bottom of the world,” Jeffrey Geddes made a discovery about sea ice formation that has the potential to provide scientists with another piece of the climate-change puzzle.

As a part of a research project on the St. George campus last summer, Geddes, an undergraduate science student, was analysing data supplied by a NASA satellite when he detected a previously unknown multi-year ice formation cycle in Antarctica’s Cosmonaut Sea. Climate scientists and researchers study sea ice and its changes to understand how it affects the polar regions because sea ice, or the lack of it, affects local climates and potentially impacts the global weather system. Geddes determined that large bodies of water surrounded by ice on three sides — known as embayments — tend to reform every three years at the same time in the same place to indicate there may be some inherent predetermining the variability of sea ice in that region,” said Geddes, now a fourth-year student at the University of Toronto.

“Our discovery that embay-
ments occur approximately every
three years at the same time in the
same place seems to indicate there
may be some inherent predeter-
mining the variability of sea ice in
that region,” said Geddes, now

working in the lab of Professor Kent Moore, chair of the chemical and physical sciences, Geddes studied NASA data on ice forma-
tions in the Cosmonaut Sea from
1979 to 2004. He found that

the volume of sea ice might

while the volume of sea ice might

While the inter-vehicle separation

Milgram and Li investigated their concept by using a low-
fidelity driving simulator to test the reactions of 40 young male partici-
pants to driving scenarios under various visibility condi-
tions. A roadway was projected onto a large screen and partici-
pants used a standard game con-
trol steering wheel and brake pedal to respond to the brake lights of a leading vehicle.

Li and Milgram manipulated optical looming cues of the lead vehicle — that is, the rear

New Brake Light System Could Mean Fewer Collisions

By Susan LaBike

A dynamic brake light system that enables rear lights on a leading vehicle to contract or expand during hard braking could help lessen how often rear-end automobile collisions occur, says new research from the University of Toronto.

Zhonghai Li, a post-doctoral
student, and Professor Paul
Milgram of mechanical and
industrial engineering worked with the fact that drivers perceive the time separation between themselves and a vehi-
cle they are following based on the size of image of the leading vehicle on the driver’s retin.

They hypothesized that if it were
possible to exaggerate how quickly the retinal image expanded, drivers might brake sooner in potential crash situa-
tions. A preliminary study using a driving simulator confirmed

that they did. The next challenge was to find an application for this knowledge.

“In the real world, we can’t manipulate the retinal images of cars,” said Milgram. “But we thought we could change the image of taillights. We guessed that if we could make a taillight system that appeared to change in size, it might have a significant effect on braking behaviour.”

Milgram and Li investigated their concept by using a low-
fidelity driving simulator to test the reactions of 40 young male partici-
pants to driving scenarios under various visibility condi-
tions. A roadway was projected onto a large screen and partici-
pants used a standard game con-
trol steering wheel and brake pedal to respond to the brake lights of a leading vehicle.

Li and Milgram manipulated optical looming cues of the lead vehicle — that is, the rear
window and right and left tail-
lights, which sit in a triangular formation — so they would imperceptibly expand and separate in response to the distance between and relative velocity of the two vehicles. In nighttime driving conditions where drivers rely heavily on brake light cues to gauge their distance from other vehicles, drivers showed a clear response to the illusion of the leading car nearing more quickly.

“We got people to brake 100 to 300 milliseconds sooner,” said Milgram, who emphasizes that while the inter-vehicle separation sensing technology required to create such a braking system does exist, much more develop-
ment and testing is necessary before implementation. “That fraction of time may seem small but given the millions of braking events every day, the difference could mean thousands of averted crashes per year.”