Friends of CRC
Les Amis du CRC
December 2013

Message from the Chair

At the end of my first year as Friends' Board Chair, I'd like to thank my fellow Board members and the membership at large for their help and support during the past year. Best wishes to all for 2014!

John Brebner

Video Production with Andrew Huddleston

At our October Board Meeting we entertained a proposal from **Andrew Huddleston**, an instructor in the Algonquin College video program, who expressed an interest in producing videos relating to Canada's early scientific achievements in space, including, but not exclusive to the Alouette program. The Board agreed that such a production would be welcomed, as long as it entailed no dollar cost to the Friends. Andrew has followed both the Canadian Space Programs and the Friends' activities for years, and certainly knows Canadian space history. We welcome him enthusiastically to this endeavour!

Accordingly, I have agreed to act as "middle-man" in engaging any of our members who would like to be interviewed about both the projects that they worked on during their career at CRC.

Based on our very informal survey at the spring luncheon in 2013, I know that some of you would be interested in participating. It's important for CRC's oral/video history be preserved. As someone who knows the value of archival photographic material, I am well aware of the need to capture as many of these memories before all our "Space Pioneers" and their unique memories are gone.

Video interviews will commence in early 2014 and proceed throughout the spring and early summer.

The Board feels that such a program, involving both our members and students at Algonquin College, will produce both a beneficial exposure of our past DRTE/CRC achievements and a real learning opportunity for Algonquin students, both in video and interview techniques as well as a better understanding of the DTRE/CRC role in the Canadian space program.

The Friends will retain all rights to distribution and usage of the interview footage, but you may expect that short clips will be made available on the internet to showcase our achievements.

John Brebner 613-731-6220

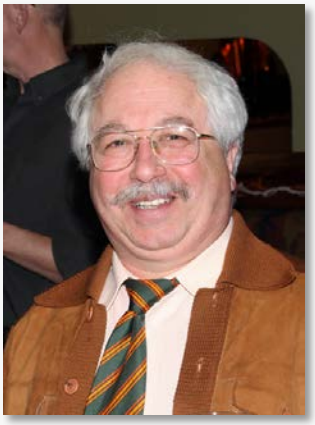
Christmas Lunch 2013

The recent Friends Christmas lunch was well-attended, with 35 Friends enjoying our annual festive gathering in the Bistro 54 at Amberwood Golf Club in Stittsville.

Many thanks to Neville Reed who organized this year's event!

Meet the Friends' Board:

Arto Chubukjian Ph.D., P.Eng., Life Member IEEE.



Arto is our most recent Friends' Board member, joining in 2013.

Arto Chubukjian earned his B.A.Sc. degree in 1971 from the University of Toronto, the M.Eng. and Ph.D. degrees in 1990 and in 2000 respectively, from the University of Ottawa, all of them in electrical engineering.

He has been a registered professional engineer in the Province of Ontario since 1975, an IEEE member since 1968 and a member of IEEE EMC Society (EMCS) since 1987. He has served as EMCS TC-6 (Spectrum Management) chair for 12 years, and as vice-chair of EMCS Technical Activities Committee for six years. He is currently a Life Member of IEEE.

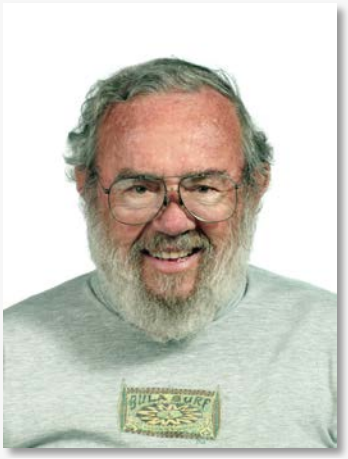
Arto Chubukjian has had a varied career spanning 40 years involving digital control systems, computers and computer controlled systems, weapon systems engineering, avionics and sensor systems engineering, EMC analysis and interference mitigation, electromagnetics, radars, antennas, propagation, HERF, HERO, HERP, Ultra Wide Band, power line telecommunications (BPL), neural networks, and computational electromagnetics.

Invited to join CRC in 2000, he carried out research on several EMC spectrum projects for Industry Canada, and chaired the Compatibility Drafting Group under the ITU Task Group 1/8 on Ultrawideband Compatibility with distinction.

Further, he was invited to chair the research task group of the NATO Research and Technology Agency that studied the effects of power line telecommunications on the HF spectrum (IST-050 RTG), results of which were widely acclaimed within NATO and within the stakeholders of the HF spectrum.

He finished his career in November 2012 as Research Program Manager in the Electromagnetics and Compatibility Research Group at the Communications Research Centre in Ottawa, Ontario, Canada.

Now For Something Different, by Colin Billowes



Golf Physics

After many years of careful observation and study, it has become evident to me that the laws of physics which control the game of golf are neither Newtonian or quantum. Rather, the game of golf complies with the laws of new, as-yet-undescribed, third theory of physics. While it is conventional to believe that golf must conform to Newtonian physics, this is clearly not so as we experience events which could not possibly be described by Newtonian physics almost every time we play.

Balls fly in all sorts of directions and distances which could not possibly have happened if golf was ruled by Newtonian physics. Equally, golf does comply with quantum physics because, in addition to the fact that quantum effects are not manifest in normal size objects, it is clear that the uncertainty principle does not apply. For example, there has never been a case of uncertainty about if the ball is in the hole or not. From this I have concluded that Golf has its own unique set of laws of physics, which are still ill-understood and much more work remains to be done before a complete set of equations can be written down.

Just as quantum physics refined the earlier Newtonian theories, rather than replacing them, so golf physics also starts with the Newtonian and quantum mechanics, adjusting and modifying them for the unique circumstances which exist on the golf course. So far, I have not been able to identify any other milieu where theses new physical laws applies - it seems to be strictly limited to golf, but it may prove that these new laws have other manifestations.

It started to became obvious to me that golf may not comply in all respects with conventional physics when I observed that strange things start to happen when the experience of the practice range is transferred to the golf course. For many years it was thought that the reason why nothing one does on the practice range seems to work on the golf course was due to some deficiency in the golfer. I suggest that the problems relating to the complete inability of most of us to transfer skills honed on the practice range to the real course is because a special set of undiscovered forces take over the striking and flight of the golf ball when it is struck on a golf course. From these observations, I slowly developed my theories that the only explanation is that golf has a special set of physics equations which modify both the quantum or Newtonian versions. The more I thought about it, the more evidence I found to support my hypothesis.

There are a number of manifestations of the unusual physics of golf which most of you will immediately recognise when they are described. First is the bounce of the golf ball. As most of you will know from experience, any struck golf ball will always bounce towards the nearest hazard or away from the hole, no matter what the trajectory, spin or the slope of the ground.

Golf Physics by Colin Billowes, *continued*

The explanation for this is under intense investigation and is thought to be an effect similar in nature to the way light waves experience a phase change when being bounced off a reflecting surface. Just as light can behave as particles under certain conditions, so the golf ball can behave as a wave and experience a phase shift as it bounces. Clearly this would cause it to veer away from its original trajectory. What is interesting is that this deflective force always bends away from the hole and towards the hazard. So far I have been unable to identify the reasons for this effect.

A second manifestation of the phenomenon of the special physics applying to golf is the well-known attraction between golf balls and water. We are all aware of this phenomenon as yet another easy water crossing or lateral hazard transit stroke, which we can hit ten times out of ten when there is no water is present, ends up in the drink. Theories on the reason for this fall into two groups - those that propose that it is a relatively simple electrostatic attraction effect caused by the interaction between the water typically found on golf courses, which is conductive, and the highly insulating properties of the golf ball. The other possible explanation is based on the special theory of relativity and proposes that golf course water hazards are capable of distorting or curving nearby space, causing flying objects like golf balls to curve into them. No matter which theory you subscribe to, the frequency with which a well-struck golf ball will make a vicious, non-Newtonian/Einsteinian turn into a water hazard is well known.

The next piece of evidence that a special physics applies to golf lies in the area of the golf swing. As you all know, it is easy for even the most terrible of golfers to make a practice swing which, time after time, brushes the grass perfectly on a good line. Place a ball at their feet and immediately, something changes and the club will either strike the ground six inches behind the ball or hit the ball at or above its equator, usually off-line. Clearly the presence of a golf ball is causing a change in the relative positions of the club, ground and ball in some relativistic way, causing the errant swing. It is noteworthy that this effect does not apply to dandelion heads, crab apples, pine cones, etc., which any duffer can hit clean and straight every time.

Putting is another realm of weird physics. In conventional physics, moving objects travel in straight lines until they are acted upon by another force which changes its direction according to easily-calculated equations of motion. In quantum physics, the concept of a path does not exist, meaning that the ball can disappear and reappear anywhere in the universe after it is putted, which my ball often does. Perhaps the bottom of the hole has some conceptual similarity to a negative black hole into which nothing can enter.

Putting clearly complies with neither of these two physics systems. We have all experienced putts which break up hill, balls which stop half a revolution short of dropping, or roll ten feet past the hole when lightly struck.

Golf Physics by Colin Billowes, *continued*

Clearly something irrational and different is happening. The professionals have come up with the term "grain" to describe this mysterious extra force working on the putt, but they ascribe it to the grass with some cockeyed notion that the grass grows towards the water and towards the sunset, thus pushing the ball towards these directions. They are to be congratulated on their recognising the effect, but their explanation is clearly rubbish, and reminiscent of the notion of the Aether invented by early physicists to explain how light is transmitted through the vacuum of the universe . This so-called "grain" effect has nothing to do with the grass and it certainly does not have any material cause like the direction of the sunset. Rather it seems to be some sort of gravitational warping effect, probably caused by the removal of the lump of earth from the hole from an otherwise symmetrical green. It seems that the hole creates a repulsive force which acts to try and turn the ball away from it.

There is a possible simple solution to this problem based on the hydrophilic nature of golf balls and their affinity for water. I believe the hole repulsion force could be neutralized if the holes were filled with water. This would introduce a force of attraction towards the hole (described above) which should cancel the repulsive force, and hopefully result in more putts going in. My research on this has regrettable been stymied by my club's grounds-keeper who has adamantly refused to let my caddy fill the holes with water just before I putt.

Finally, no review of the dynamics and physics of golf would be complete without an attempt to explain the antics of the ball tee, which can behave in a most amazing manner. Sometimes they vanish without trace even on the most manicured tees. At other times they end up in locations which simply cannot be explainable by Newtonian physics. Other characteristics of all tees is that the more they cost, the easier they are to lose and the harder the material they are made of, the easier they are to break. Clearly there is some interaction going on between ball, tee and club here but so far, no one theory appears to fit all the facts. One suggestion is that tees are able to climb through worm-holes in the space-time continuum and simply vanish to reappear in another part of this or another universe. I find them in car parks, suit pockets and even wash rooms which does tend to support this theory. I would not be at all surprised if we found the surface of one of Saturn's moons littered with our missing tees.

So while I don't expect to get a Nobel prize for these theories, in part because of narrow minded grounds-keepers who thwart my experiments, I am confident that the basic premises discussed above will eventually lead to changes in course design, equipment and rules to allow compensating devices which straighten out the path of the golf ball, and which will eliminate some of the morale-destroying, dreadful results which occur so often after we have, once more, struck the ball perfectly, only to see it veer off course into some hazard or another.

Colin Billowes

Obituaries

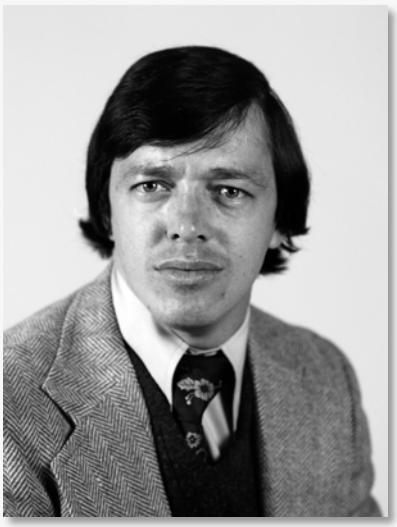
BASKIN, Hazel A.

Long time member of the Friendship Force. Peacefully on December 6, 2013 at the age of 79. Predeceased by her husband Alonzo Baskin. Loving mother of William and his wife Laurie Baskin, Linda and her husband Gordon Wilson. Dear grandmother of Tony Wilson, Pamela Morash and great-grandmother of Alyssa Morash. Cherished sister of Elma Baskin, John Mustard and Gwendolyn Charter. She will be fondly remembered by many nieces and nephews. Hazel retired as head librarian at CRC in 1996.

LYRETTE, Jacques

It is with great sadness that we announce the peaceful death of Jacques Lyrette on November 18, 2013, at the age of 68. Beloved husband of Madeleine Richer and proud father of Jean-Bruno (Andrée) and Andrée-Anne .

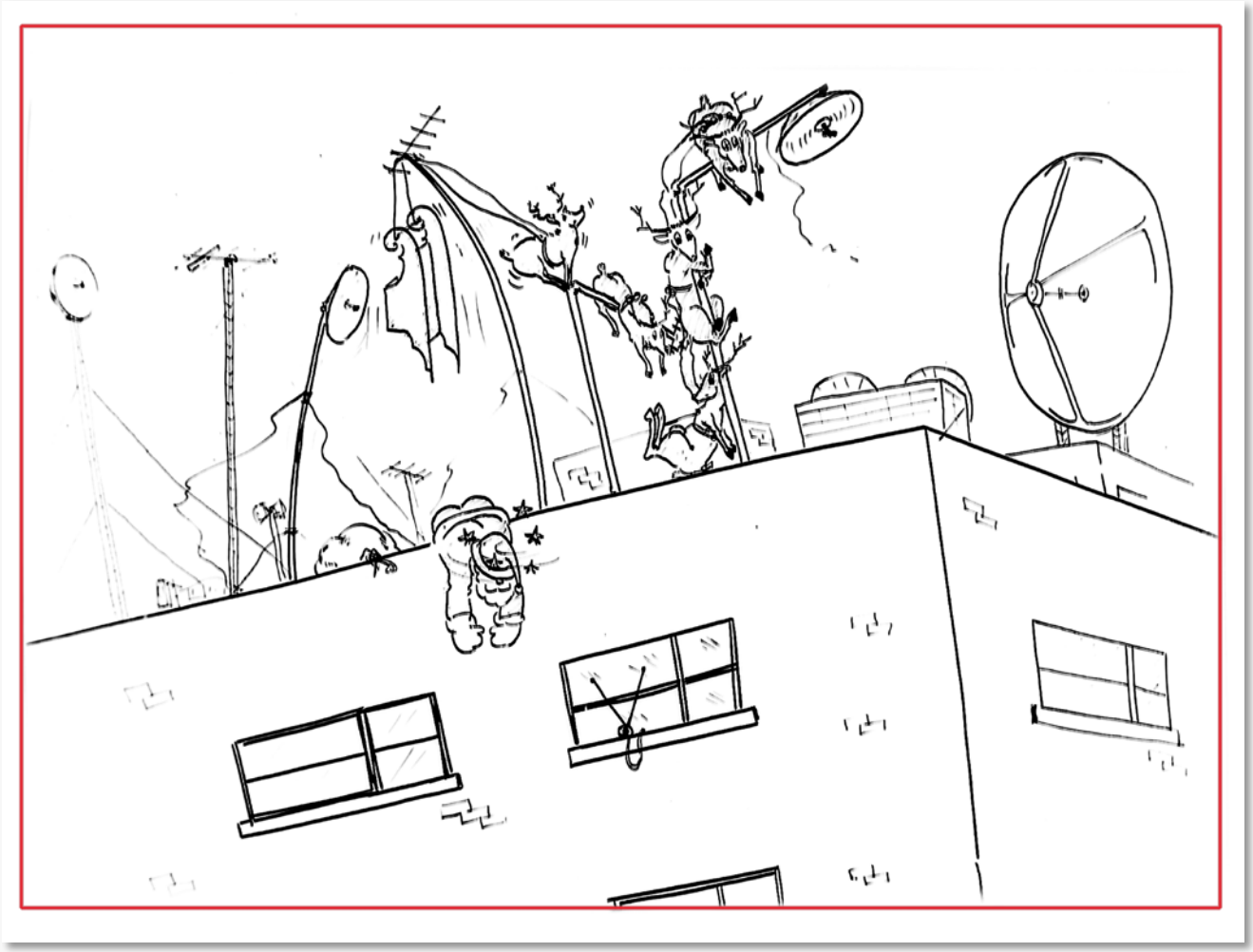
Jacques was President of CRC from 1993 to 1996. It was as a result of his suggestion that the Friends of CRC organization was born.



Above and right: Jacques Lyrette in 1995 and 1975.

Left: Bob Huck, Rolf Mamen and Jacques Lyrette with MSAT spacecraft.

Memories of the Past: Santa Arrives at DRTE by Art Adams



Contact Us...

Chair, Archivist, Newsletter:	John Brebner	john.brebner@brebner.com	613-731-6220
Secretary:	Neville Reed	nev_reed@yahoo.ca	613-596-1434
Membership:	Seymour Shlien	sshlien@crc.ca	613-722-1296
Badges:	Andre Kennedy	aek@storm.ca	613-829-9697

Website: friendsofcrc.ca email: crcfriends@igs.net Office Phone: 613-990-6673

Facebook Page: https://www.facebook.com/CRCFriends?ref=stream

Mailing Address: Friends of CRC, 3701 Carling Avenue, P.O. Box 11490, Stn. H, Ottawa, ON K2H 8S2