ORBITAL ANGULAR MOMENTUM

To the world amateur press. For immediate release.

FIRST OAM SIGNAL EXPERIMENTED IN VENICE

For the first time in history, on June 24, 2011 at 21.38 in Venice, there was successfully transmitted and received the first radio signal using **Orbital Angular Momentum, OAM**, of electromagnetic field.

This extraordinary new kind of transmission of radio waves is the result of the discoveries of the Venetian scientist and astrophysicist Fabrizio Tamburini from the University of Padua, in collaboration with his colleague Prof. Bo Thidé, SM5DFW, of the Swedish Institute of Space Physics.

This is the first public experiment carried out by Tamburini after laboratory tests carried at the CNR in Padua and in Uppsala University acoustic antenna chamber in Sweden.

The experiment, designed to attract the attention of both the scientific community and the media to the **new discovery** by Dr Tamburini, was carried out before more than 1000 people watching from St Mark's Square waterfront. It consisted of the simultaneous transmission of two radio signals at the identical frequency of 2414 MHz, one using a plain Yagi beam and the second using a specially-developed parabolic antenna capable of giving orbital angular momentum (also called 'vorticity') to radio-waves.

The two signals were successfully received separately one after the other without using multiplexing or any digital enhancements by one receiver connected

through a splitter to two normal Yagi beams.

The tuning consisted "simply" of moving one of the two receiving antennas in the direction of the transmitted signal to catch the proper orbital angular momentum using for the first time the physical principle of OAM.

Two carriers modulated with different audio pitches first and then two video signals were successfully received separately on the same frequency with no reciprocal interference.

According to Dr Fabrizio Tamburini this new application of a so-far-neglected principle of physics will not only allow the use of multiple channels at the same frequency but it will enhance, on the optical and X-ray field, the resolving power of electronic microscopes and telescopes by one order of magnitude, opening a new era of telecommunications, medicine and astronomy.

The location of the experiment was the Basin of St Mark in Venice, between

the island of San Giorgio and the historic Ducal Palace at a range of 442 metres.
A scientific conference was held before the experiment in which Sir Prof. Michael


Berry, distinguished physicist from the United Kingdom, Nobel candidate and Ing. Giuliano Berretta, chairman of Eutelsat, expressed their excitement at the new discovery.

Patron of the experiment was the Princess Elettra Marconi, daughter of the inventor of Radio.

At the end of the successful first transmission Dr Fabrizio Tamburini said:


"**I dedicate this first experiment to the radioamateurs of Venice.**

Their work and assistance was priceless. They were like angels." The radio amateurs of Venice assisted Tamburini side-by-side with his collaborators to solve some technical issues, thereby representing all the radioamateurs of the world in this historic day for mankind.

The radio amateurs who took part in the experiment were:

I3BQC Vittorino Boaga, **I3MDU** Michele Del Pup,
IK3RIY Martino Rizzi, **IW3GSH** Francesco Carraro.

ARI Venice branch June 29, 2011