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Warm and cold gas in low-mass protostars : Herschel Space Observatory and ground-based surveys

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1. **Yıldız, Umut A.**; et al. *APEX-CHAMP$^+$ high-J CO observations of low–mass young stellar objects: IV. Survey of Low-mass Protostars*, To be submitted (Chapter 5 in this thesis).

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Popular Articles

2. Efe Tuncel, **Umut A. Yıldız**, *APEX Telescope: First Precursor to ALMA, (APEX Teleskobu: ALMA'nın ilk Öncüsü) in Turkish*, Tübitak Bilim ve Teknik Dergisi, Aralık 2012, Sayı: 541, Sayfa: 38-42

1. **Umut A. Yıldız**, *Science with ALMA, (ALMA ile Bilim) in Turkish*, Tübitak Bilim ve Teknik Dergisi, Ekim 2011, Sayı: 527, Sayfa: 30-35 [pdf]

Curriculum Vitae

I was born in February 28, 1980 in Istanbul, Turkey, however, my parents' hometown is Ordu. My father was a chief-policeman, therefore I have lived in many cities and attended many different schools within Turkey; İstanbul, Bingöl, Karabük, Zonguldak, then Çanakkale where I have gotten my high school diploma from Çanakkale Milli Piyango Anatolian High School in 1998.

Then, I found the opportunity to follow my life ambition to become an astronomer and won the nationwide university entrance examination to study at the Ankara University, Department of Astronomy and Space Sciences. I was quite active in my early years, including being the president of the Amateur Astronomy Club (ASART) of Ankara University. At the end of the first semester of my third year, I decided to improve my English and found myself at the London Heathrow Airport, 10 days later. My plan was to stay there for the next semester and summer –6-7 months–, but after the summer, I decided to apply to British universities to study astronomy. In September 2001, I was accepted by University College London for an astronomy diploma program. One year after, I decided to go back to Turkey because a degree from a UK university is very expensive and my old university was a lot cheaper. After two years of UK experience, I went back to Ankara University. Reregistering to the university was quite painful, because many of the second year classes were either abolished or the lecture code had changed. I was by now a fifth year student but finished only the first year lectures. However, I was quite motivated to finish my university, so I took as many courses as possible. In my sixth (final) year, I passed 24 lectures which is probably still a record at the Faculty of Science, and also finished a Minor in Mathematics and become within the top 5% of the peer students. If I could have taken three more lectures, I would have finished a Physics Minor as well, but I simply did not have time.

In September 2005, I started my Masters study at the University of Groningen, Kapteyn Astronomical Institute. I studied within the *Stellar Populations Group* led by Reynier F. Peletier, who is now the director of the Kapteyn Institute. The project was based on the data from MAGPOP-ITP *(Multiwavelength Analysis of Galaxy Populations - International Time Programme)* training network, which is funded by the European Union with the Kapteyn Institute as the Associated-Node. I joined the group in February 2007 to work on the project called "Stellar Populations of Dwarf Galaxies: Optical and Near-IR Surface Photometry of Quiescent Dwarf Galaxies". We obtained H & K band near-IR images of 55 dwarf galaxies by using the William Herschel Telescope (WHT), Telescopio Nazionale Galileo (TNG), and the Nordic Optical Telescope (NOT) at La Palma, Canary Islands in 13 nights. During my research, I have reduced and calibrated the images to study the surface photometry of each dwarf galaxy. Close to the completion of the project, I was

fortunate to receive a 3-months research fellowship from the MAGPOP project in order to continue my activities in the IAC *(Instituto de Astrofisica de Canarias)*, Tenerife. I guess the life in Tenerife matured me and prepared me for the future. The experience from this research led me to find another great project with more substantial data from *Herschel* Space Observatory.

In December 2008, I was accepted to the Ph.D. position at Leiden University, Leiden Observatory, in the *Molecular Astrophysics Group* led by Prof. Dr. Ewine van Dishoeck in order to work with the WISH (Water In Star-forming regions with *Herschel*) guaranteed-time key program to conduct research on star formation. Delays of the launch of *Herschel* and a cosmic ray hit to the HIFI instrument six month after launch, led me to study some ground-based APEX and JCMT observations and better prepare for *Herschel* data, which started to pour down in March 2010. I was very lucky to participate in three large *Herschel* consortiums (WISH, HOP, DIGIT), which gave me the opportunity to collaborate with more than 100 great astronomers. Key discoveries of our teams include the first detection of water and oxygen molecules in prestellar cores and protostellar disks. I also had the opportunity to have hands-on experience with sub-/mm observations via several observing trips to APEX (Chile), JCMT (Hawaii), and IRAM 30m (Spain). During my thesis research, I really enjoyed working on large-scale observational data. Particularly, I also got a chance to participate in the *Herschel*-HIFI calibration group in SRON-Groningen, which also added another direction for my future to join future instrumentation projects.

What next? Well, since childhood, I lived and traveled in many different cities in many different countries. Therefore I am not attached to one specific city, but I am only interested in great projects that I can contribute to and work. The plan is to continue to pursue a career in astronomical research and instrumentation. I will continue in Pasadena, California, (USA) as a postdoctoral researcher at the NASA Jet Propulsion Laboratory and California Institute of Technology with Prof. Dr. Paul Goldsmith.

So, who is Umut A.?

OK, it is still me. In my legal documents, I do not have a middle name. But since Yıldız is a very common surname in Turkey and even there are more than 500 Umut Yıldız on Facebook, I decided to create a bogus middle name —actually just a letter— **A.**, in order reduce the chances for having the same name and surname in astronomical papers. Even though sometimes I forget to add A., I am always trying to use this letter in every of my scientific papers. If you wonder what A. stands for, well, I have not decided yet, but it fits with **A**stronomy, right (what a geek) :).

Acknowledgments

These last pages mark the end of my 4+ years in Leiden. I would like to thank all the people that I have shared memories with at the Leiden Observatory during my Ph.D. I have to admit that Leiden Observatory is not only a great place for research but also an *amazing palace of style and excellence*. Specifically, the Leiden Astrochemistry Group is probably leading one of the best research among many groups in the world.

I am grateful to all the members of the WISH (Water In Star-forming regions with *Herschel*), DIGIT (Dust, Ice and Gas In Time) and HOP (*Herschel* Oxygen Project) teams. Being a member of those large and successful teams taught me the importance of collaboration and the idea of "*consensus*" instead of "*competition*" approach as another great way to win–win.

Even though I am not allowed to pronounce his name here, my very special thanks begins to "the Danish guy" (LEK), who acted as my mentor and the only person who somehow has the ability to calm me down with patience anytime. You were the magic touch for many obstacles that I have had and I learned a lot of things from you that I will apply in my life. Things would be very different without your presence. My wonderful officemates, starting from the current ones; Thanja Lamberts whom we talk about the system around the world, Ricardo Herbonnet, and Joe Mottram. And my former officemates, thanks to Isa Oliveira for advocating me from usual suspects, Herma Cuppen and Emily Tenenbaum for being our big sisters. Moving in the corridor, gracias a Irene San José García for all the fun and sharing daily moods and chocolates; Daniel Harsono, the Python guy, thanks for all the help; Edith Fayolle, the Parisian lady; Nienke van der Marel, the only Dutch in the group; Kalle Torstensson, the great photo hunter; and Karoliina Isokoski, thanks for the cover idea. I am also greatly indebted to those who keep the Observatory running smoothly, the computer people, Erik, David, Niels, and Aart; and the secretaries, Kirsten, Jacqueline, Jeanne, Anita, and Liesbeth. Even though it is 672 km away from us, our Garching group is always very close to us via our weekly Leiden-MPE videocons. Agata Karska, the fellow WISH PhD student in Garching, and the postdocs Simon Bruderer, Greg Herczeg, Davide Fedele, thanks for sharing many memories during many videocons and meetings.

Thanks to our large *ESO Turkiye* team, where we worked (still working) hard for initiating conversations for Turkish membership to ESO. Our group is very large, therefore I cannot write all the names here but I have to mention a few key people with whom I have shared a lot. Thanks to Arif Solmaz, Özgecan Önal, and Halit Mirahmetoğlu, and the entire team for helping me to deal with many obstacles that we experienced in the process. Also very special thanks to Mrs. de Zeeuw for helping me to initiate conversations with the ESO DG.

I really enjoyed my time in SRON-Groningen, where we worked hard at the *Herschel*-HIFI Performance Verification process in order to test and verify that the instrument is working well. That was very much "fingers crossed" times in fall 2009 when we were really looking forward to see HIFI up and running after the cosmic ray hit event happened a few months back. I spent great times and shared a lot of experience with the peer HIFI-ICC trainees, Tom Bell, Per Bjerkeli, Elvire De Beck, Nathan Crockett, Mihkel Kama, Robin Lombaert, Massimo de Luca, Zoltan Makai, Zsofia Nagy, Susana Pacheco, Matthijs van der Wiel, and Shiya Wang. Thanks to all HIFI calibration staff members, specifically Ronan Higgins, Russell Shipman, David Teyssier, Carolyn M^{c}Coey, Ian Avruch, Michael Olberg, Peter Roelfsema, Volker Ossenkopf, Frank Helmich, Fabrice Herpin, Pat Morris, Meltem Akyılmaz, Christophe Risacher, Bertrand Delforge, and Femke Flederus.

Other Turkish astronomers in Groningen that I shared quite a lot memories with all the fruitful discussions my brother Seyit Höçük, my sisters Esra Tigrak, and Ayçin Aykutalp are much appreciated.

Of course, family is the most important thing in the world. I am very much indepted to my wife, Fatime for all the support during my Ph.D. She is very patient for all the times and with me. Almost at the same hour of the approval of my thesis, a new protoyıldız turned to a yıldız (in case you don't know yet, "Yıldız" means "Star" in Turkish). Duru Lara welcome to the world!

My mother Emine, father Enis, and sister Burcu, this is for you. Anne ve baba, sizlerin desteğiniz olmasaydı nereye kadar gidebilirdim kim bilir. Yıllardır neredeyse hayatımın yarısını sizlerden uzaklarda geçirmiş olsam da her zaman sizin sesinizi duymak ve manevi olarak yanımda hissetmek bana güç verdi ve bugünlere ulaşmamı sağladı. Burcu, biliyorum ki ben yurtdışında olduğumda en çok sen yanlız kaldın ve uzakta bir abim var dedin. Sizlere sabrınız ve desteğiniz için çok teşekkür ediyor ve öpücükler gönderiyorum.

My family-in-law Adnan and Yıldız Aydoğmuşlu, and sisters-in-law, Figen and Sibel, this is for you. Çok kısa bir süre içerisinde beni de aranızda kabul edip benim Hollanda'daki ailem oldunuz. Sizlerin de yanımızda olmanız, sabrınız ve desteğiniz için çok teşekkür ederim.

Finally, thanks to all the people that I may forget to mention their names here.

“ - Knowledge is to understand.
- To understand who you are
- If you not know who you are
- What’s the use of learning?”

– Yunus Emre (ca.1238-ca.1320) - Turkish Scholar

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