

# Stockholm goes DARWIN

**Current members:**

**Napoli, December 2013**

**Jan Conrad**

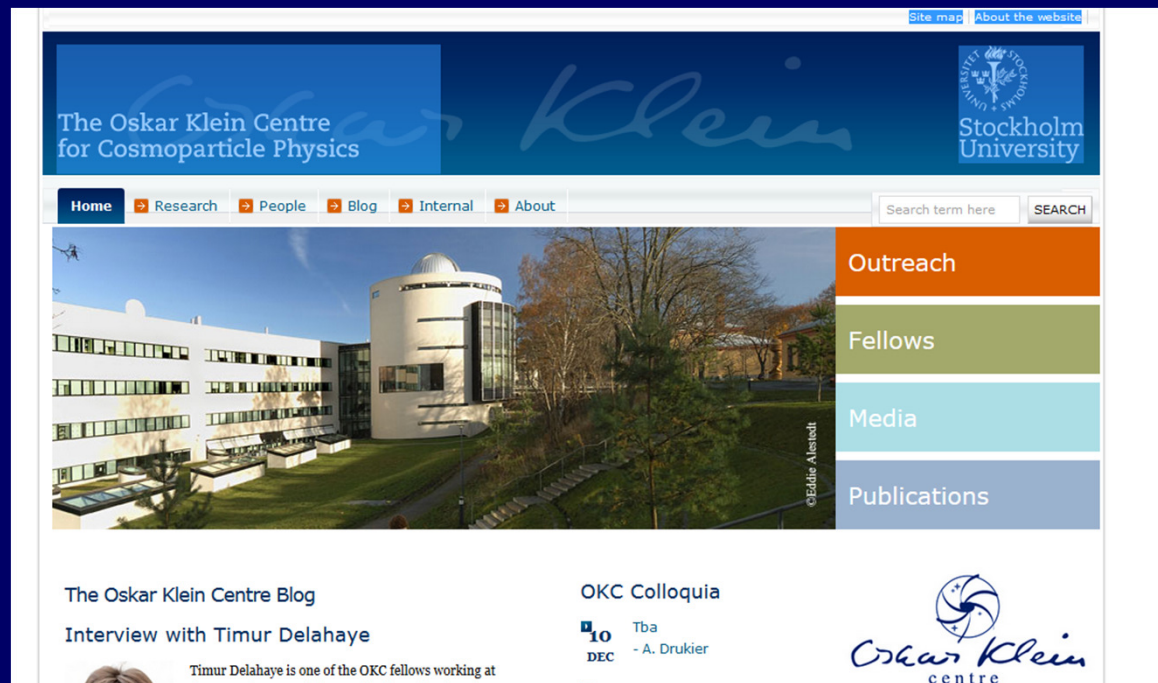
**Thomas Schwetz-Mangold**

**Fysikum, Stockholms Universitet**



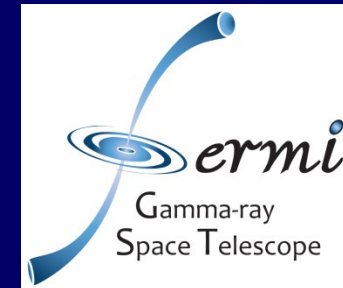
# Oskar Klein Center for Cosmoparticle Physics

- ~ 100 scientists
- Dark Matter, Dark Energy, Compact Objects, Cosmic structure
- Theory: Phenomenology, String theory, high energy astrophysics
- Experiments: IceCube, Fermi-LAT, HESS, SKA, LOFAR, ATLAS, PAMELA, PogoLite, CTA

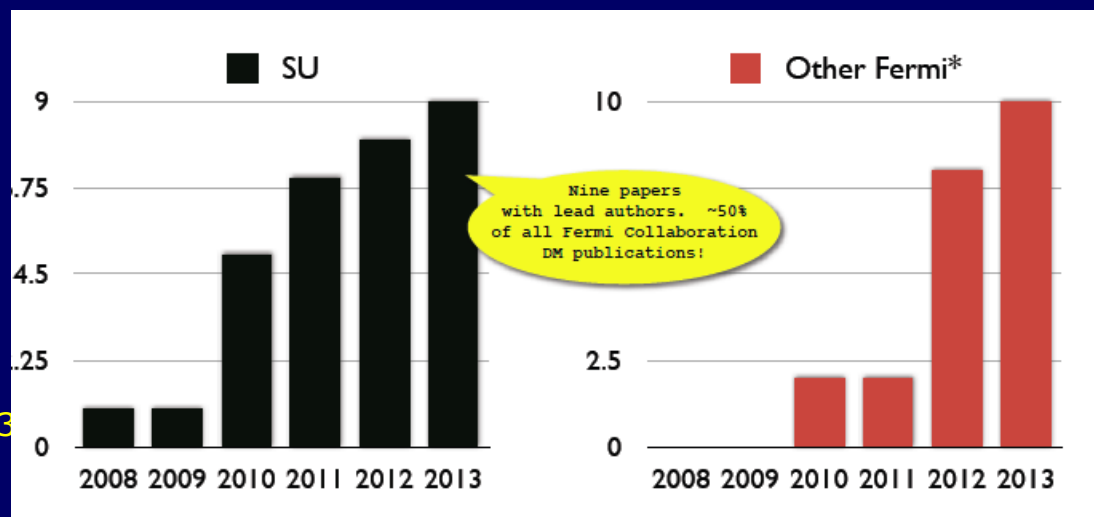


# The Stockholm group and current involvements

- JC+ 1 assist. prof, 4 post-docs, 3 PhD students
- Strong involvement in indirect detection with gamma-rays (led or lead the DM working groups in the respective experiments).
- Close collaboration with phenomenology group  
(Bergström, Edsjö, Schwetz-Mangold)



13-08-13



Jan Conrad, Oskar Klein Centre, Stockholms Universitet

# Example result obtained in my group: combined dwarfs

Constraining Dark Matter Models from a Combined Analysis of Milky Way Satellites with the Fermi Large Area Telescope

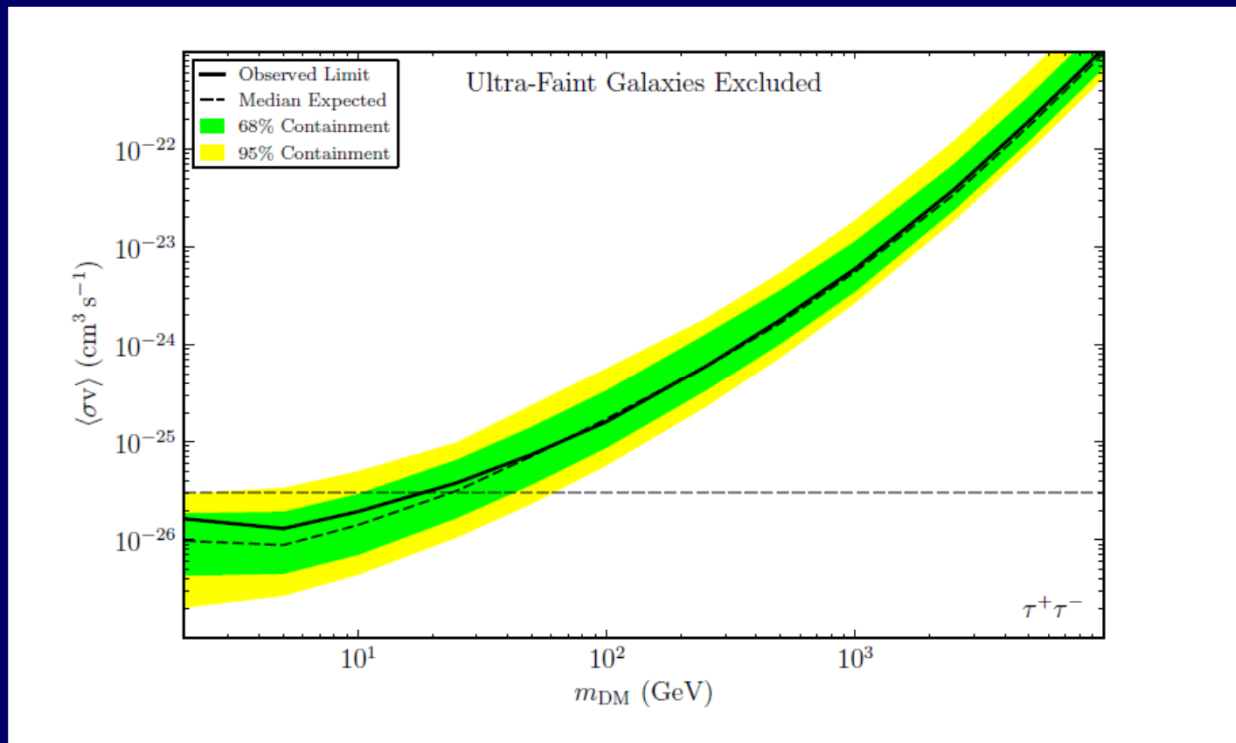
M. Ackermann,<sup>1</sup> M. Ajello,<sup>1</sup> A. Albert,<sup>2</sup> W. B. Atwood,<sup>3</sup> L. Baldini,<sup>4</sup> J. Ballet,<sup>5</sup> G. Barbiellini,<sup>6,7</sup> D. Bastieri,<sup>8,9</sup> K. Bechtol,<sup>1</sup> R. Bellazzini,<sup>4</sup> B. Berenji,<sup>1</sup> R. D. Blandford,<sup>1</sup> E. D. Bloom,<sup>1</sup> E. Bonamente,<sup>10,11</sup> A. W. Borgland,<sup>1</sup> J. Bregeon,<sup>4</sup> M. Brigida,<sup>12,13</sup> P. Bruel,<sup>14</sup> R. Buehler,<sup>1</sup> T. H. Burnett,<sup>15</sup> S. Buson,<sup>8,9</sup> G. A. Caliandro,<sup>16</sup> R. A. Cameron,<sup>1</sup> B. Cañadas,<sup>17,18</sup> P. A. Caraveo,<sup>19</sup> J. M. Casandjian,<sup>5</sup> C. Cecchi,<sup>10,11</sup> E. Charles,<sup>1</sup> A. Chekhtman,<sup>20</sup> J. Chiang,<sup>1</sup> S. Ciprini,<sup>21,11</sup> R. Claus,<sup>1</sup> J. Cohen-Tanugi,<sup>22,\*</sup> J. Conrad,<sup>23,24,25,†</sup> S. Cutini,<sup>26</sup> A. de Angelis,<sup>27</sup> F. de Palma,<sup>12,13</sup> C. D. Dermer,<sup>28</sup> S. W. Digel,<sup>1</sup> E. de Souza e Silva,<sup>1</sup> P. S. Drell,<sup>1</sup> A. D'Elia-Warner,<sup>1</sup> L. Falck,<sup>22</sup>

Dark Matter Constraints from Observations of 25 Milky Way Satellite Galaxies with the Fermi Large Area Telescope

M. Ackermann,<sup>1</sup> A. Albert,<sup>2</sup> B. Anderson,<sup>3,4</sup> L. Baldini,<sup>5</sup> J. Ballet,<sup>6</sup> G. Barbiellini,<sup>7,8</sup> D. Bastieri,<sup>9,10</sup> K. Bechtol,<sup>2</sup> R. Bellazzini,<sup>11</sup> E. Bissaldi,<sup>12</sup> E. D. Bloom,<sup>2</sup> E. Bonamente,<sup>13,14</sup> A. Bouvier,<sup>15</sup> T. J. Brandt,<sup>16</sup> J. Bregeon,<sup>11</sup> M. Brigida,<sup>17,18</sup> P. Bruel,<sup>19</sup> R. Buehler,<sup>1</sup> S. Buson,<sup>9,10</sup> G. A. Caliandro,<sup>2</sup> R. A. Cameron,<sup>2</sup> M. Caragiulo,<sup>18</sup> P. A. Caraveo,<sup>20</sup> C. Cecchi,<sup>13,14</sup> E. Charles,<sup>2</sup> A. Chekhtman,<sup>21</sup> J. Chiang,<sup>2</sup> S. Ciprini,<sup>22,23</sup> R. Claus,<sup>2</sup> J. Cohen-Tanugi,<sup>24,\*</sup> J. Conrad,<sup>3,4,25,†</sup> F. D'Ammando,<sup>26</sup>

Phys.Rev.Lett. **107** (2011) 241302

1310.0828.pdf



## First time robust exclusion of thermal WIMP

# My groups future (if I get it my way).



# Competence and experience

- **Background in experimental (astro)particle physics**
  - AMANDA → CERN-ALICE → PAMELA → Fermi- LAT, HESS, CTA
- **Highest impact: advanced statistical methods/high level analysis, background rejection,/event reconstruction, MC simulations, phenomenology, scientific management.**
- **Hardware: Photosensors, strong involvement in CTA camera test facilities work package**
- **Eager to learn ...**

## Infrastructure and engineering.

- **Fysikum has a technical division consisting of about 15 research engineers (mostly PhD level).**
  - vacuum/cryo
  - electronics, detectors, mechanical construction.
  - accessibility: depends on external funding. 1- 3 engineers full time.
- **Instrumentation physics group:**
  - digital electronics, read-out, slow control etc .... e.g. providing some trigger electronics.
  - accessibility: depends on if you get the researchers interested (and if they are free).
- **Nanofabrication lab, clean room facilities**

# Plan for DARWIN

- **Ongoing activity:**
  - Scoping study (with T. Jacques, P. Scott, C. Savage)
- **Potential contributions:**
  - Photosensor tests (Mini-TPC, 2 kL Lxe, ~10 sensors??)
    - Pending funding ....
  - MC simulations
  - Algorithms
  - Computing, software development
  - will of course help in writing/Horizon2020 proposal etc.
- **What will this meeting bring?**
- **Timescale to be defined**

**1 Postdoc announcement (closed now)**



## My collaboration history

- **Undergraduate: Hamburg (particle physics and astrophysics)**
- **1999-2003: AMANDA (PhD 2003)**
  - Novel statistical inference method (200 citations)
- **2004-2005: CERN fellow, ALICE Silicon Pixel**
  - Beam test analysis lead, first physics task force
- **2006- now: Fermi-LAT (PI in Sweden)**
  - Lead of Dark Matter working group (2007-2009), Member of Senior Scientist advisory committee
- **2009- now: H.E.S.S. (PI in Sweden)**
  - (Astroparticle) Physics coordinator (2013-2014)
- **2008- now: CTA (PI in Sweden)**
  - Lead of Dark Matter working group (2008-2013), strong involvement in Camera Test Facilities work package ....